



Requirements for central systems and EasyGo HUB

**Annex 2.1 to
Joint Venture Agreement
Toll Service Provider Agreement**

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9.0	2020.09.14	SR/ASK	Approved by ESC

Changes in the document made after version 8.0 are highlighted yellow.

Abbreviations and definitions

The list below covers technical abbreviations and definitions used in documents 201 - 208.

General abbreviations and definitions are listed in document 401.

ACFC	AutoPASS Collection and Forwarding Central (for Norwegian entities)
ACT	Actor Table
ADU	Application Data Unit (ISO 14906)
AIT	Accepted Issuer Table
ANSI	American National Standards Institute
BIN	First part of the PAN no. identifying the issuer (TSP)
CEN	Committee European Normalisation
CFC	Collection and Forwarding Central; Central for the collection and distribution of data between Toll Service Providers and Toll Chargers
Context data	ACT + TST + AIT
Context mark	Comprises the organisation that issued the contract, the type of contract and the context version
CS	Central System
DSRC	Dedicated Short Range Communication
EFC	Electronic Fee Collection
EGH	EasyGo HUB
FIC	Financial Information Confirmation
FIF	Financial Information File
FTP	File Transfer Protocol
GDPR	EU - General Data Protection Regulation
HGC	Heavy Goods Vehicle Confirmation
HGV	Heavy Goods Vehicle
IIN	Issuer Identifier Number
ISO	International Standardisation Organisation
LF	Line Feed
LPN	License Plate Number
MII	Major Industry Identifier
NAC	Not Accepted Table Confirmation
NAT	Not Accepted Table

OBE / OBU	On Board Equipment / On Board Unit
PAN	Personal Account Number
RSA	Asymmetric public key encryption method, named after Rivers, Shamir and Adleman
RSAES-OAEP	RSA Encryption Scheme with Optimal Asymmetric Encryption Padding
RSASSA-PSS	RSA Signature Scheme with Appendix - Probabilistic Signature Scheme
RSE	Road Side Equipment
SU	Service User
TC	Toll Charger
TIC	Transaction Information File Confirmation
TIF	Transaction Information File
TSP	Toll Service Provider
TSPA	Toll Service Provider Agreement
TST	Toll Station Table
TTP	Trusted Third Party
UTC	Universal Time Coordination
VPN	Virtual Private Network
XML	EXtensible Markup Language (File transfer protocol)

1 Introduction

1.1 Purpose of the EasyGo HUB

The communication between the Toll Service Providers (TSP) and Toll Chargers (TC) is carried out via the EasyGo HUB (EGH) which collects, validates and merges files and forwards the information to the correct recipient(s). The EGH imports every file of any file type received from an actor and generates a new file with the same or the enriched content and provides this to the addressed actor for download. The EGH acts as an interconnecting collection and forwarding system between the TCs and TSPs. All data files that are to be exchanged between the central systems of the TCs and TSPs will be imported by the EGH and exported as a new file with the same or the enriched content.

In addition to be an intermediary between the central systems of TCs and TSPs, the EGH generates the following types of data available for TC and TSP system supervisors:

- Alarms
- Warnings and other messages to supervisor(s) of data exchange operation
- Statistics and reports of data exchange operations and general data traffic

In addition, the EGH can support direct communication between TCs and TSPs connected via the EGH. Such communication is supported without any validation of data content. For details, see chapter 3.5.

1.2 General data flow through the EasyGo HUB

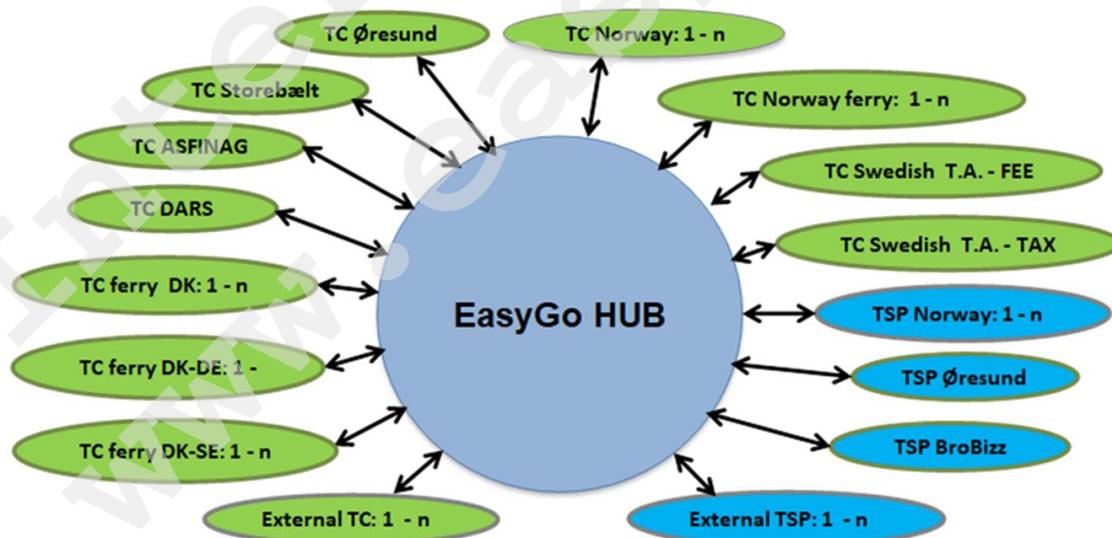


Figure 1: Main data flow through the EasyGo HUB

The Norwegian TCs and TSPs are currently represented by the Norwegian Public Roads

Administration in EasyGo. This may change due to the on-going reform of the tolling sector in Norway.

External TSPs may connect to individual EasyGo TCs (example: EETS) via the EGH provided they follow agreed specifications and procedures. The same is the case for external TCs (example: parking companies) who can connect to EasyGo TSPs via the EGH. External TCs and TSPs are often referred to as service recipients.

Definitions of external TCs and external TSPs are given in chapter 1 in document 404 “*Overview of organisations involved with EasyGo*”

1.3 Overview of EasyGo data files

There are 5 types of data files exchanged by means of the EGH. The format and semantics of these files are described in detail in document 203 “*Technical requirements data format and interface specifications*”, while the general rules for processing and validating the files are described in this document.

1.3.1 Parameter lists

Actor Table (ACT...)

Accepted OBE intervals from TSP (AIT...)

Toll Station Table (TST...)

A functional description of these files can be found in chapter 4.3 “*Originate EFC context data*” in document 403 “*EasyGo processes*”

1.3.2 Validity lists of Service Users

Black list (NAT...)

Black list confirmation (NAC...)

White list (HGV...)

White list confirmation (HGC...)

A functional description of these files can be found in chapter 4.6 “*Distribute validation data*” in document 403

Transaction lists of Service Users

Transaction Information File (TIF...)

Transaction Information Confirmation (TIC...)

A functional description of these files can be found in chapter 5.2 “*TC generates transactions*” in document 403

Financial information of Service Users

Financial Information File (FIF...)

Financial Information Confirmation (FIC...)

A functional description of these files can be found in chapter x.x “xxxxxxx” in document 403 (to be included in document 403)

1.3.3 Application data unit

The ADU enables TCs and TSPs to exchange data between themselves without the content being checked by the EGH.

These ADU data files are intended to support data exchange between TCs and TSPs in support of the requirements of EN ISO 12855:2015 and CEN/TS 16986:2016 + AC:2017.

A functional description of this data transfer can be found in chapter 5.13 in document 403 (to be included in document 403 **currently under revision**)

1.4 Additional data and references

There is a need for additional data exchange in addition to the specified data files. This additional data exchange is primarily based on email. An example of such additional data exchange is the reporting of quality data as specified by document 307 “*EasyGo quality system*”. The ADU option described in chapter 1.3.5 above will be able to replace some of the data being exchanged via email.

If needed, some or all of these additional data exchange interfaces will be established as a file exchange and the format and semantics will then be defined in document 203 and the general rules for processing and validating these data interfaces will be included in this document.

1.5 EasyGo version of data files

In order to be able to introduce new file formats during operation of EasyGo (EasyGo Basic and EasyGo+) the EGH shall be able to receive, handle and produce the following two different versions of the files based on the versions of each file described in document 203 for a defined transition period:

- current approved version
- previously approved version

Note that change of Version is only used when major changes like length of header and/or records length of header, or records or fields. When the EasyGo steering committee approves an update of the specifications, i.e. defining a new file format version, they also decide upon the duration of the transition period in which the files in the previous approved format will still be valid and supported by the EGH. The EGH will be able to receive, handle and produce files in both approved formats. The general rule is that the new version may be used **after** 2 months and the old version may be used up to 6 months after approval of the new version.

The EGH is able to deliver all file types described in chapter 1.3 in both the previous approved and the current version during the transition period. By default, all formats remain unchanged until the recipient of these files informs EasyGo management that he is

capable of processing the current format. HGC and NAC will be according to the format the TSP used in providing the HGV and NAT files.

The TIF and TIC files are forwarded in the same format they are received, as they may contain information in the current format which may not be present in the previously approved version and thus cannot be converted by the EGH. The date of transition from the previous to the current format needs a bilateral agreement between the originator and any recipient of these file types. This date shall be within the defined transition period. The EGH must, for a period, be able to receive, handle and produce both formats of these files as well. The EGH keeps internally a table with the status for each file the TC and TSP are allowed to send and receive.

The exchanged data files have a version stated independently for each type of file which is defined in document 203.

The validation rules in this document only apply for the current version of files.

Files to be used in the EasyGo production system are:

File type	Current version		Previous version	
	Version no.	Valid from	Version no.	Valid to
ACT*	130001	1/6/2014	120001	30/9/2014
AIT*	130001	1/6/2014	120001	30/9/2014
TST*	130001	1/6/2014	120001	30/9/2014
HGV*	120001	1/6/2012	000000	30/9/2012
HGC*	120001	1/6/2012	000000	30/9/2012
NAT*	120001	1/6/2012	000000	30/9/2012
NAC*	120001	1/6/2012	000000	30/9/2012
TIF*	130001	1/6/2014	120001	30/9/2014
TIC*	130001	1/6/2014	120001	30/9/2014
FIF*	130001	1/6/2014	N/A	N/A
FIC*	130001	1/6/2014	N/A	N/A
ADU	N/A	N/A	N/A	N/A

*) The date of transition between the previously approved format and the current format is to be agreed upon among the originator and recipient of each file type within the transition period between “valid from” and “valid to”

2 Overview of the data exchange process

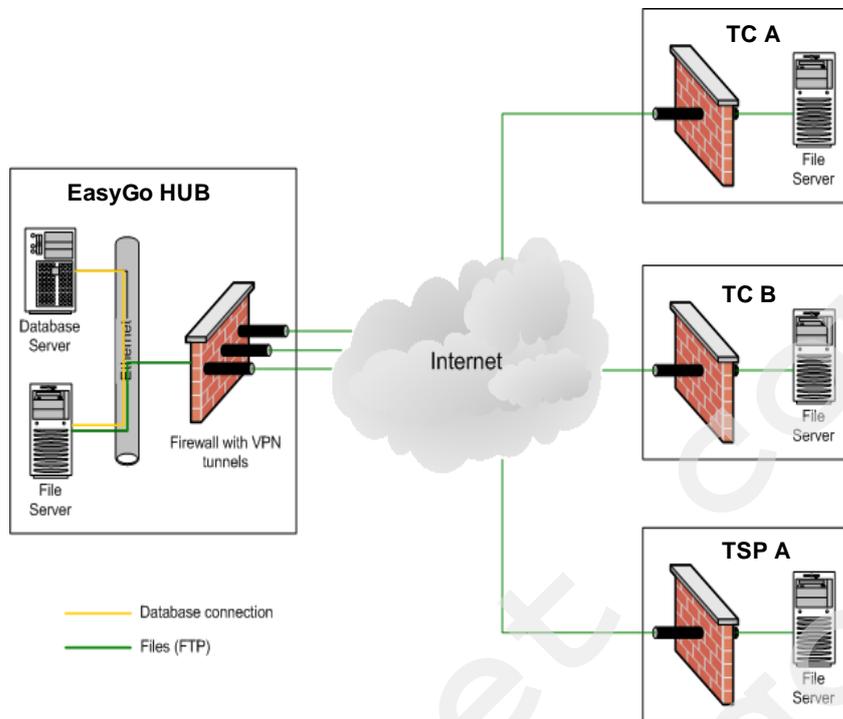


Figure 2: Overview of data connections

2.1 Data exchange principles

Data exchange between the EGH, TCs and TSPs is based on an FTP transfer through an encrypted VPN tunnel. The public internet is used as the underlying communication media. **The EGH scans all files for virus at reception before processing any files received.** The EGH and the central system of the connected TCs and TSPs shall be connected to the internet with the capacity and security architecture that is required to perform a smooth and secure operation. **All connected actors must comply to the EasyGo Security framework (103 EasyGo security policy including annexes A, B and C).**

The EGH contains a production system and an identical test system in order to allow tests to be performed in parallel without affecting the production environment. **In addition, a development system is available for EGH but not available for TC and TSP.**

Each TC and TSP is connected directly to the EGH and has its designated folders described in chapter 2.2 for delivering and receiving data files.

The TCs and TSPs are responsible for delivering files to the In\New folder of the EGH. The EGH is afterwards responsible for validating, processing and transferring these files to the recipients' Out\New folder in its own file system structure.

In general, transferring files to the EGH has the following sequence:

1. An actor (TSP / TC) logs on to the EGH's FTP server with his username and password

2. The actor uploads any file he wishes to transmit to his own In\Temp folder
3. The actor moves the file to his own In\New folder when the upload is finished
4. The actor logs off from the EasyGo FTP server with "quit"

In general, retrieving files from the EGH has the following sequence:

1. An actor logs on to the EGH's FTP server with his username and password
2. The actor downloads any file he wishes to retrieve from his own Out\New folder
3. The actor deletes the file from his own Out\New folder when the download is finished
4. The actor logs off from the EGH's FTP server with "quit"

2.2 The structure of folders

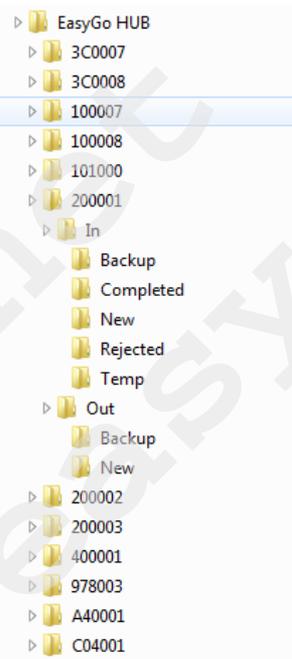


Figure 3: Folder structure on the EasyGo HUB

The structure of folders for TCs and TSPs and the EGH are identical.

2.3 Use of folders

2.3.1 In\Temp

All files uploaded to the EGH must be uploaded to this folder. The file must be moved by the originator to the In\New folder with a valid name according to document 203, when the upload is completed. This routine is needed in order to ensure that the EGH will not start processing any files before the upload is finished.

2.3.2 In\New

All new files from an actor are moved to this folder by the originator after the upload to his In\Temp directory is finished. The EGH will only process files placed in this folder.

The EGH will start with the general verification process of any file delivered to the In\New directory of any originator. Depending on the result of the validation the files are either moved to the In\Completed or In\Rejected folder

2.3.3 In\Backup

All files moved by an actor from his In\Temp folder to the In\New folder are automatically copied to this folder by EGH's FTP server before processing it.

2.3.4 in\Completed

This folder is the final destination of any files that have been sent to the EGH and have passed the first validation.

2.3.5 In\Rejected

This folder is the final destination of any files that have been sent to the EGH and have not passed the first validation. The originator will receive an email with information about the rejected file and can download a copy from his In\Rejected folder in order to investigate further why the file did not pass the validation routines. If any confirmation files were generated in the verification phase they will be placed in the Out\New folder of the originator.

2.3.6 Out\New

All new files sent to an actor are placed in this folder by the EGH. The actors are responsible for downloading them from this folder on their own according to the agreed schedule described in chapter 5. When the download has finished, all files shall be deleted from this folder. A copy will remain in his Out\Backup folder.

2.3.7 Out\Backup

All files placed by the EGH in the Out\New folder for download of the recipient are automatically copied to this folder by EGH's FTP server.

2.4 Responsibility

2.4.1 Managing the folders

The TCs and TSPs are responsible for:

- Moving all files from their own In\Temp folder to the In\New folder
- Emptying their own In\Temp, In\Rejected and Out\New folder

All other folders are managed by the EGH according to the agreed schedule described in chapter 5.

2.4.2 EGH Storing of data

The EGH is only responsible for storing data files in the In\Backup, In\Completed, In\Rejected or Out\Backup folders in order to facilitate short production stops up to one week and to provide data necessary to monitor the system and produce the agreed statistical material.

File type	Storage time	On archive server
ACT	180 Days ¹⁾	All files provided
AIT	180 Days ¹⁾	All
TST	180 Days ¹⁾	All
NAT	15 Days	None
NAC	15 Days	1 year ²⁾
HGV	15 Days	None
HGC	15 Days	1 Year ²⁾
TIF	7 Days ⁴⁾	Data extract to support QA monitoring and statistics. ³⁾
TIC	7 Days ⁴⁾	Data extract to support QA monitoring and statistics. ³⁾
FIF	2 Days ⁴⁾	Data extract to support QA monitoring and statistics.
FIC	2 Days ⁴⁾	Data extract to support QA monitoring and statistics.
ADU	None ⁵⁾	None ⁵⁾

¹⁾ Last correct version is always stored regardless of time. The data in these files may contain personal data for the contacts at the toll chargers or toll service providers. It should however be noted that storage of personal data in the ACT file is not according to document 203.

²⁾ See chapter 4. The data in these files may contain personal data for entries which were not correctly processed. These files are produced by the EasyGo HUB and it has been decided to store it up to one year in case of a claim raised close to the time limit for SU complaints.

³⁾ See chapter 4.1.2

⁴⁾ The files will be deleted when a TIC/FIC has been received and the data extract from TIF and TIC has been recorded for QA monitoring and statistics. This extract does no longer contain any personal data.

⁵⁾ Data will only be available until recipient has received the data and deleted them from his folder according to 2.4.1 “Managing the folders”.

2.4.3 TC data storage

Each TC shall process and storage personal data only in accordance with applicable data protection law. Each TC is responsible for storing/deletion of

- sent and received configuration files (ACT and TST files sent by the TC to EasyGo TSPs and AIT files received from the EasyGo TSPs)
- sent EasyGo transaction data (TIF/FIF files sent by the TC to EasyGo TSPs),
- received confirmation files (TIC/FIC files from the EasyGo TSPs) and
- received validation list (HGV and NAT files from the EasyGo TSPs)

own EasyGo transaction data (data sent by the TC to EasyGo), received Confirmation files and validation list (HGV and NAT) in order to settle transaction according to the requirement for exchange of transactions, section 6.2, 002 Toll Service Provider Agreement. If relevant local regulations require longer storage time this must be respected.

If data volumes exceed the above limits the TC / TSP must contact the EasyGo HUB for manual processing.

2.4.4 TSP data storage

Each TSP shall process and store **age** personal data only in accordance with applicable data protection ~~law~~ legislation. Each TSP is responsible for storing/deleting **on** of

- sent and received configuration files (ACT and TST received from the TCs and AIT files sent to the TCs)
- ~~sent EasyGo data (data sent by the TSP to EasyGo TCs),~~
- received transaction files (TIF/FIF files received from the TCs)
- sent confirmation files (TIC/FIC files sent to the TCs) and
- sent validation list (HGV and NAT files to the TCs)
- received transaction files (NAC/HGC files received from the EGH)

own EasyGo data (data sent by the TSP to EasyGo), received transaction files in order to settle transactions according to the requirements for exchange of transactions, section 6.2, in document 002 Toll Service Provider Agreement. The TSP must also store data to comply with Annex 304 Invoice specification chapter 5 Storage of Invoices. If relevant local regulations require longer storage time this must be respected for each country where the TSP provides services.

2.5 Data volume

The EGH, TC and TSP must be able to handle the expected data volumes within the schedule for data exchange. The volume of each type of file is stated below. The data in header/footer is negligible.

Estimated data volumes:

File type	Number of records	Size per record	Total size	Updated
ACT	1.000	2 kB	2 MB	On demand
AIT	1.000	200 B	200 KB	On demand
TST	10,000	200 B	2 MB	On demand

File type	Number of records	Size per record	Total size	Updated
NAT/NAC* (EasyGo)	10.000.000	64 B	600 MB	Daily
NAT/NAC* (EasyGo+)	25.000	64 B	50 MB	Daily
HGV/HGC* (EasyGo)	5.000.000	128 B	600 MB	Daily
HGV/HGC* (EasyGo+)	5.000.000	128 B	600 MB	Daily
TIF/TIC*	up to 150.000	1 B	150 MB	Daily
FIF/FIC	1.000 to 50.000	1 kb	1-50 MB	Daily
ADU	N/A	N/A	N/A	Daily

* Confirmation files are usually very small if everything is OK, but in case of failure in all lines they have the same size as the original file.

The number of NAT entries is restricted to 25 % of the number of HGV entries for each TSP, unless it is otherwise agreed by all affected EasyGo TCs. This rule applies for EasyGo+ and EETS/REETS services only.

If data volumes exceed the above limits the TC / TSP must contact the EasyGo HUB for manual processing.

3 Procedures

3.1 Validation rules

3.1.1 General validation rules for the EasyGo HUB

The general validation rules at the EGH involve the following checks of each file received:

- File name shall be correct
- File name shall be unique (File has not been sent previously)
- List name to a specific recipient is unique (List not sent previously)
- File name and list header shall contain correct and authorized Actor IDs of originator and recipient
- Version information in header shall be either the current version or the previous version during transition time
- File header, body and footer records shall be syntactically correct according to the specific format definition of document 203
- The ActorID of the originator in the header record of the file shall be the same as the ActorID of the originator indicated in the file name
- The ActorID of the recipient in the header record of the file shall be the same as the ActorID of the recipient indicated in the file name (if applicable)
- The ActorID of the originator in the header record of the file shall be defined in the ACT
- The ActorID of the recipient in the header record of the file shall be defined in the ACT
- The field "Number of records" in the header shall be in accordance with the actual number of body records in the file
- The field "Number of transactions" in the header of a TIF or TIC file is in accordance with the actual number of transactions in the body (only if the value in the header for the number of transactions is filled with a value different from 0)
- The Date and sequence number in header specified in the fields "List Sequence" and "Previous List Sequence" shall have a valid syntax. **If the EGH detects that the previous list has not yet been received the EGH shall issue a warning to the originator of the file by email and to the supervisor of the EGH. However, the file with the list shall be accepted and processed.** If a TIF or TIC file out of sequence is processed at a later time, it will not be rejected but will be processed. Any other file (especially NAT and HGV files) sent out of sequence will be rejected.

- Some TCs validate based on OBE-ID while others use the PAN (BIN + BIN extension). Appendix A shows the validation principle for each EasyGo TC
- The content of the field “PAN” is in an allowed range according to the valid AIT (if applicable)

If the EGH detects an error during the general validation of a file according to the rules stated above, the file is rejected, and an alarm message shall be sent to the originator of the file by email and to the supervisor of the EGH indicating the rejection of the file and the reason for the rejection.

In case of a HGV or NAT file, a corresponding HGC or NAC file shall be generated informing the originator about the rejection of the file and the reason for the rejection if possible. In case of total rejection of a HGV or NAT file, no HGC or NAC file will be produced. The file will be placed in the TSPs rejected catalogue and an alarm will be sent describing the failure. (see document 203 section 2.5.2 HGC and 2.7.2 NAC)

Note that the EGH does not check TIF or FIF files for failures which shall be reported by the TSP in a TIC or FIC file.

3.1.2 Actor specific validation rules

The responsibility for the correctness of files and their content rests with the originator.

The procedures and rules of handling the files at the originator, at the EGH and at the recipient are different for each file type and are described below.

The format of each file name and list name is described in document 203. In each section only the actor specific validation rules are described, which need to be performed by the actor in addition to the general validation at the EGH described in chapter 3.1.1.

3.1.3 Filtering of “global” files

Filtering of files is done internally in the EGH. Files where filtering may apply are: ACT, AIT, TST, NAT and HGV in order to ensure that a TC or TSP only receive the relevant data from the EGH. Filtering is only possible of files where the EGH receives local input files from actors and distributes global files.

Files that are sent directly from one actor to another actor cannot be filtered. (TIF/TIC)

Filtering is done hierarchically with the ACT file on the most top-level and done in filter groups.

Basically, the filtering setup is done by choosing which information should be included in the filtered file.

I.e. Actor “A” wants to have ACT information on 7 out of 10 other actors. This is done by the EGH creating a filter group and specifying that ACT files shall only contain information on these 7 specific actors.

After that, Actor “A” is added to this filter group and the filter setup for Actor “A” is done.

It must be noted, that filtering is an inherited process that applies to all other file types as well. Hence Actor “A” in the example above, will only receive information related to the 7 actors he has in his filtered ACT file, and in all other file types he receives. E.g. the TST file only contains information from the TCs he receives information about. The same goes for TSP and AIT, HGV and NAT.

AIT can further be filtered if only some of the OBE context mark and or PAN no. are allowed at a TC. The filtered AIT will be reflected in the HGV and NAT file received by the TC. As an example, Austria only receives EasyGo+ issuer data.

Filtering is a continuous administrative process, since filters must be maintained due to new actors, issuer-ranges, toll stations etc. being added. **Filtering agreed between TC/TSP must be reported to EGH operation team.**

Note the term “global” below is used for both a total list including data from all and a filtered list containing only data in accordance with the recipient’s agreement with EasyGo.

3.2 Parameter tables

3.2.1 EFC context data requirement - Introduction

The parameter tables ACT, TST and AIT together form the EFC context data. The following procedures describe the handling of the ACT, the AIT and the TST between originator, EGH and recipient.

3.2.2 ACT (130001)

- The EGH registers the TC or TSP in the EGH, the first time based on information sent by the TC or TSP according to Document 208 “*Requirements for VPN access to the EasyGo HUB*”. From this information, the folders on the EGH are set up and the VPN connection established.
- Each TC and TSP shall report any changes in their data to the EGH either manually by email or produce a “local” ACT containing only his own data

Each TC and TSP shall validate the data before providing it to the EGH according to the following validation rules:

- Values in fields "Currency 1" to "Currency 4" shall be unique
- Values of all mandatory fields contain data according to document 203
- ~~○ All specified transmitted email addresses shall be verified (e.g. by sending a test email)~~
- ~~○ All transmitted phone numbers shall be verified (e.g. by placing a call)~~
- Each TC and TSP shall provide a successfully validated “local” ACT in his In\Temp folder or send the data by email to the EGH according to the schedule for data exchange (see chapter 5)

- Each TC and TSP shall move an uploaded “local” ACT from his In\Temp folder to his In\New folder, when the upload is completed
- The EGH shall offer the possibility to manually enter ACT data provided by email or import the data from the body record(s) of any received “local” ACT
- The EGH shall validate the manually entered data or the “local” ACT according to the following validation rules in addition to the general validation rules for the EGH described in chapter 3.1.1:
 - The fields Currency 1 to Currency 4 shall be unique
 - All mandatory fields shall contain valid data according to the specification in document 203

Any breach of these rules has a total rejection of the “local” ACT as a consequence

- The EGH shall report any errors in the manually entered data or “local” ACT by sending an alarm message to the originator and to the supervisor of the EGH by email and move it from the In\New folder of the originator to the In\Rejected folder
- The EGH shall move the “local” ACT from the In\New folder of the originator to the In\Completed folder if the validation was successful but shall not send any confirmation by email
- The EGH shall be able to produce a “global” ACT based on the successfully validated “local” ACT data provided by the connected TCs or TSPs
- The EGH shall be able to filter the “global” ACT as described in chapter 0
- The EGH shall provide the new “global” ACT according to the schedule for data exchange (see chapter 5) in the Out\New folder of all recipients (all TCs and TSPs)
- Each TC and TSP shall be able to download the “global” ACT from his Out\New folder on the EGH
- Each TC and TSP shall delete the “global” ACT from his Out\New folder on the EGH after the download
- Each TC and TSP shall validate the correctness of the format and the content of their own data in the body records of the “global” ACT

The following rules shall be applied during validation:

- All mandatory fields shall be filled according to the format version defined in document 203
- The number of characters in each field shall be according to the format description
- The content of each field shall be the same as sent to the EGH
- Each TC and TSP shall report any error in their own data by sending an alarm message to the supervisor of the EGH by email

- Each TC and TSP shall be able to implement the information from the “global” ACT in their central system according to the specification (e.g. to use VAT number; create necessary debtor and creditor accounts ...)

3.2.3 AIT (130001)

- A TSP shall be able to produce a “local” AIT according to the format version defined in document 203 and upload it to his In\Temp folder on the EGH according to the schedule for data exchange (see chapter 5)
- A TSP shall move an uploaded “local” AIT from his In\Temp folder to his In\New folder, when the upload is completed
- The EGH shall validate each received “local” AIT according to the following validation rules in addition to the general validation rules for the EGH described in chapter 3.1.1:
 - The BIN (+ BIN ext.) + context mark shall be unique

NOTE 1: The BIN field is mandatory. The BIN ext. field is optional unless more than 6 digits are necessary to identify the TSP. It is then mandatory to fill in the additional digits in the BIN extension. If not filled, the BIN + context mark shall be unique.

Any breach of these rules has a total rejection of the “local” AIT as a consequence

- The EGH shall report any errors in the “local” AIT by sending an alarm message to the originator of the file and to the supervisor of the EGH by email and move it from the In\New folder of the originator to the In\Rejected folder
- The EGH shall move the “local” AIT from the In\New folder of the originator to the In\Completed folder if the validation was successful but shall not send any confirmation by email
- The EGH shall compile the valid “local” AIT from all TSPs received according to the schedule for data exchange (see chapter 5) into a new “global” AIT. If no new “local” AIT was received from an originator or the received file was rejected, the last valid “local” AIT of this originator shall be used during the compilation
- The EGH shall be able to filter the “global” AIT based on selected rows from the AIT table if required as described in chapter 0
- The EGH shall provide the new “global” AIT according to the schedule for data exchange (see chapter 5) in the Out\New folder of all recipients (all TCs and TSPs)
- The TSP who initiated the update of the “global” AIT, shall download the “global” AIT from his Out\New folder on the EGH according to the schedule for data exchange (see chapter 5)
- The TSP who initiated the update of the “global” AIT shall delete the “global” AIT from his Out\New folder on the EGH

- The TSP who initiated the update of the “global” AIT shall validate the correctness of the format and the content and their own data in the body records of the “global” AIT

The following rules shall be applied during validation:

- All mandatory fields shall be filled according to the format version defined in document 203
- The number of characters in each field shall be according to the format description
- BIN (+ BIN ext.) + context mark shall be unique
- See NOTE 1. The content of each field shall be the same as sent to the EGH
- The TSP shall correct any errors in his own data by uploading a new updated “local” AIT file to his In/Temp folder on the EGH according to the schedule for data exchange (see chapter 5) and move it to his In\New folder initiating a new update procedure
- Each TC and TSP shall be able to download the “global” AIT from his Out\New folder on the EGH. If more than one “global” AIT is available for download, only the last version is valid. Any other previous version may be disregarded
- Each TC and TSP shall delete all “global” AIT files from their Out\New folders on the EGH after the download
- Each TC or TSP may validate the correctness of the format of the “global” or filtered AIT

The following rules shall be applied during validation:

- All mandatory fields shall be filled according to the format version defined in document 203
- The number of characters in each field shall be according to the format description
- BIN (+ BIN ext.) + context mark shall be unique
- See NOTE 1. Each TC shall be able to implement the information in the “global” AIT in their central system and RSE according to the specification (e.g. to limit the accepted OBEs on the RSE ...)
- The TC may ensure that only those OBEs are accepted for transactions, where the PAN is included in the BIN+BIN ext. range of the “global” or filtered AIT. If the TC uses the OBE-ID for validation the filtering described cannot be used.

3.2.4 TST (130001)

- A TC shall be able to produce a “local” TST according to the format version defined in document 203 and upload it to his In\Temp folder on the EGH according to the schedule for data exchange (see chapter 5)
- A TC shall move an uploaded “local” TST from his In\Temp folder to his In\New folder, when the upload is completed
- The EGH shall validate each received “local” TST according to the following validation rules in addition to the general validation rules for the EGH described in chapter 3.1.1:
 - The ActorID of the TC, Station Code and Lane identification shall be unique

Any breach of these rules has a total rejection of the “local” TST as a consequence

- The EGH shall report any errors in the “local” TST by sending an alarm message to the originator of the file and to the supervisor of the EGH by email and move it from the In\New folder of the originator to the In\Rejected folder
- The EGH shall move the “local” TST from the In\New folder of the originator to the In\Completed folder if the validation was successful but shall not send any confirmation by email
- The EGH shall compile the valid “local” TST from all TCs received according to the schedule for data exchange (see chapter 5) into a new “global” TST. If no new “local” TST file was received from an originator, or the received file was rejected, the last valid “local” TST of this originator shall be used during the compilation
- The EGH shall be able to filter the “global” TST based on rows in the ACT file if required as described in chapter 0
- The EGH shall provide the new “global” TST according to the schedule for data exchange (see chapter 5) in the Out\New folder of all recipients (all TCs and TSPs)
- The TC who initiated the update of the “global” TST shall download the “global” TST from his Out\New folder on the EGH according to the schedule for data exchange (see chapter 5)
- The TC who initiated the update of the “global” TST shall delete the “global” TST from his Out\New folder on the EGH after the download
- The TC who initiated the update of the “global” TST shall validate the correctness of the format and the content and their own data in the body records of the “global” TST

The following rules shall be applied during validation:

- All mandatory fields shall be filled according to the format version defined in document 203

- The number of characters in each field shall be according to the format description
- The content of each field shall be the same as sent to the EGH
- The ActorID of the TC, Station Code and Lane identification shall be unique
- The TC shall correct any errors in his own data by uploading a new updated “local” TST file to his In\Temp folder on the EGH according to the schedule for data exchange (see chapter 5) and move it to his In\New folder initiating a new update procedure
- Each TC and TSP shall be able to download the “global” TST from his Out\New folder on the EGH. If more than one “global” TST is available for download, only the last version is valid. Any other previous version may be disregarded
- Each TC and TSP shall delete all “global” TST files from their Out\New folders on the EGH after the download
- Each TC and TSP may validate the correctness of the format and the content of the “global” TST

The following rules shall be applied during validation:

- All mandatory fields shall be filled according to the format version defined in document 203
- The number of characters in each field shall be according to the format description
- The ActorID of the TC, Station Code and Lane identification shall be unique
- Each TSP shall be able to implement the information in the “global” TST in their central system according to the specification (e.g. to use the relevant data to produce a correct invoice to the Service User ...)

3.3 Validity lists of Service Users

The blacklist (NAT) and the white list (HGV) together form the Validity lists of Service Users.

3.3.1 NAT (120001)

The following procedures describe the handling of the blacklist (NAT) between originator, EGH and recipient and the shift of risk between the TC and the TSP in connection with them.

A blacklist (NAT) shall be sent whenever a TSP needs to revoke the payment guarantee for an OBE issued to a SU. The conditions and the periods of time when the acceptance of an OBE within a toll regime are limited are solely in the responsibility of the TSP that

issued the OBE. Any such decision to revoke the validity of an OBE leads to a new entry in a “local” NAT

A TSP shall be able to produce a “local” NAT according to the format version defined in document 203 and upload it to the In\Temp folder of the EGH

The following rules shall be applied during production:

All mandatory fields shall be filled according to the format version defined in document 203

The number of characters in each field shall be according to the format description

The ActorID in the “local” NAT shall be the same as the ActorID of the originator

The ActorID in the “local” NAT shall be defined in the ACT

The PAN and the context mark in the in the “local” NAT shall be defined in the BIN (+ BIN ext.) + context mark fields in the AIT

A TSP shall move an uploaded “local” NAT from his In\Temp folder to his In\New folder, when the upload is completed

The responsibility of the delivery of a valid “local” NAT according to the schedule for data exchange (see chapter 5) to the EGH lies always with the TSP, i.e. the “infrastructure” cannot be made responsible.

Any error not attributed to a corrupt “local” NAT from a TSP which was disputed by the EGH lies in the responsibility of the cluster of TCs. The liability for any toll transactions by an OBE which was correctly blocked by the issuing TSP (i.e. put on an acknowledged “local” NAT) thus lies with the cluster of TCs.

The EGH shall validate each received “local” NAT according to the general validation rules for the EGH described in chapter 3.1.1. Any breach of these rules have a total rejection of the “local” NAT as a consequence

The EGH shall additionally validate each received “local” NAT according to the following validation rules:

The PAN and the context mark in the NAT shall be defined in the BIN (+ BIN ext.) + context mark fields in the AIT. If not, the line is removed before compiling the “global” NAT

The PAN and/or OBE ID shall be unique. In case of identical information one of the lines shall be removed from the “local” NAT. In case of one PAN for two OBE IDs only the first line with of the duplicate entries shall be kept, the second line shall be removed. In case of two PANs for the same OBE ID both lines shall be removed before compiling the “global” NAT

The PAN shall be within the range allowed by the AIT of the TSP and the number of digits shall be correct. If not, the line shall be removed

Any breach of these rules has a partial acceptance of the “local” NAT as a consequence, where the lines which are non-conformant are removed before processing it further

The EGH shall move the “local” NAT from the In\New folder of the originator to the In\Rejected folder if the validation led to a total rejection

The EGH shall move the NAT from the In\New folder of the originator to the In\Completed folder if the validation was fully or partially successful

The EGH shall produce a NAT confirmation file (NAC) for each received “local” NAT based on the result of the validations above and shall provide it in the Out\New folder of the originator of the NAT on the EGH (see details on the processing of the NAC in chapter 3.3.2)

The EGH shall compile the valid “local” NAT from all TSPs received according to the schedule for data exchange (see chapter 5) into a new “global” NAT. If no new “local” NAT was received from an originator or the received file was totally rejected, the last valid “local” NAT from this originator shall be used during the compilation

The EGH shall be able to filter the “global” NAT based on rows in the AIT table if required as described in chapter 0

The EGH shall provide the new “global” NAT according to the schedule for data exchange (see chapter 5) in the Out\New folder of all recipients (all TCs)

Each TC shall be able to download the “global” NAT from his Out\New folder on the EGH according to the schedule for data exchange (see chapter 5)

The responsibility of downloading any new “global” NAT list from the EGH lies always with the TC, i.e. the “infrastructure” cannot be made responsible.

The liability for any toll transactions from all OBE(s) which should have been blocked lies with the TC.

Each TC shall delete the “global” NAT from his Out\New folder on the EGH after the download

Each TC may validate the correctness of the format and the content of the “global” NAT

The following rules shall be applied during validation:

The “global” NAT shall be delivered according to the schedule for data exchange (see chapter 5)

All mandatory fields shall be filled according to the format version defined in document 203

The number of characters in each field shall be according to the format description

No entries shall be present that should have been filtered according to the rules of the TC

The TC may include a validation on the allowed change in the size of the NAT in his system and may stop the processing if the change in the size exceeds a certain limit

The TC may include a validation on the number of OBE blocks resulting from the processing of the NAT in his system and may stop the processing if the number of OBE blocks exceeds a certain limit

Each TC may report any errors in the file by sending an alarm message to the supervisor of the EGH by email.

Each TC shall activate the received “global” NAT according to the schedule for data exchange (see chapter 5) defining the end of the grace period for the TC to block any blacklisted OBE. The liability for any toll transactions with blacklisted OBE is transferred from the TSP to the TC after the end of the grace period (i.e. the payment guarantees of the TSP ends).

Any error in the processing of a NAT which is not clearly due to a disputed “local” NAT or a failed download of the “global” NAT by a TC is attributed to the EGH.

In case of such an error the management of the EGH shall analyse the error and rectify the problem and transmit a corrected “global” NAT according to the schedule for data exchange (see chapter 5). The last correct NAT remains active in the systems of the TC until a new valid “global” NAT is transmitted to the TCs.

The cost of any toll transactions from all OBE(s) which should have been blocked in the various toll domain(s) of all connected TC(s) is summed up and divided among the TCs according to the variable costs of the association fee (see document 102 “*Budget and agreed contribution quotas*” chapter 2.2.2).

3.3.2 NAC (120001)

The following procedures describe the handling of the blacklist confirmation (NAC) between originator, EGH and recipient.

The EGH shall be able to produce a NAT confirmation file (NAC) for each received “local” NAT

NOTE 1: The NAC shall contain only the header and footer records in case of a total rejection of the “local” NAT

NOTE 2: The NAC shall contain only the rejected lines in case of partial acceptance of the “local” NAT indicating for each line the reason of rejection

NOTE 3: A confirmation file (NAC) is produced and sent back to the TSP when the file is accepted or partially accepted. In case of total rejection of a NAT file no NAC file will be produced. The file will be placed in the TSPs rejected catalogue and an alarm will be sent describing the failure. The NAC file contains information whether the file was accepted or partly accepted if and where the failure has occurred. (See document 203 section 2.7.2 NAC)

The EGH shall provide the NAC according to the schedule for data exchange (see chapter 5) in the Out\New folder of the originator of the “local” NAT (TSP)

The TSP shall be able to download the NAC from his Out\New folder on the EGH

The TSP shall delete the NAC from his Out\New folder on the EGH after the download

The TSP shall initiate an appropriate error handling (e.g. solve the detected errors in his central system, send a new correct “local” NAT ...)

3.3.3 HGV (120001)

The following procedures describe the handling of the white list (HGV) between originator, EGH and recipient.

A TSP shall be able to produce a “local” HGV according to the format version defined in document 203 and upload it to the In\Temp folder of the EGH

The following rules shall be applied during production:

All mandatory fields shall be filled according to the format version defined in document 203

The number of characters in each field shall be according to the format description

The ActorID in the “local” HGV shall be the same as the ActorID of the originator

The ActorID in the “local” HGV shall be defined in the ACT

The PAN and the context mark in the in the “local” HGV shall be defined in the BIN (+ BIN ext.) + context mark fields in the AIT

Only valid, non-blocked OBE shall be included in the “local” HGV (OBE not included in the NAT list from the TSP)

If applicable the TSP may include a validation on the allowed change in the size of the “local” HGV list in his system

A TSP shall move an uploaded “local” HGV from his In\Temp folder to his In\New folder, when the upload is completed

The EGH shall validate each received “local” HGV according to the general validation rules for the EGH described in chapter 3.1.1. Any breach of these rules have a total rejection of the “local” HGV as a consequence

The EGH shall additionally validate each body record of a received “local” HGV according to the following validation rules:

The PAN and the context mark in the in the HGV shall be defined in the BIN (+ BIN ext.) + context mark fields in the AIT. If not the line is removed before compiling the “global” HGV

Only valid, non-blocked OBE shall be included in the “local” HGV. If a blocked OBE from a corresponding NAT is found on the “local” HGV it shall be removed before compiling the “global” HGV

The PAN and/or OBE ID shall be unique. In case of identical information one of the lines shall be removed from the “local” HGV. In case of one PAN for two OBE IDs only the first line with of the duplicate entries shall be kept, the second line shall be removed. In case two PANs for the same OBE ID both lines shall be removed before compiling the “global” HGV

The PAN shall be within the range allowed by the AIT of the TSP and the number of digits shall be correct. If not, the line shall be removed

Any breach of these rules has a partial acceptance of the “local” HGV as a consequence, where the lines which are non-conformant are removed before processing it further. The EGH shall move the “local” HGV from the In\New folder of the originator to the In\Rejected folder if the validation led to a total rejection.

The EGH shall move the HGV from the In\New folder of the originator to the In\Completed folder if the validation was fully or partially successful.

The EGH shall produce a HGV confirmation file (HGC) for each received “local” HGV based on the result of the validations above and shall provide it in the Out\New folder of the originator of HGV on the EGH (see details on the processing of the HGC in chapter 3.3.4).

The EGH shall compile the valid “local” HGV from all TSPs received according to the schedule for data exchange (see chapter 5) into a new “global” HGV. If no new “local” HGV was received from an originator or the received file was totally rejected, the last valid “local” HGV from this originator shall be used during the compilation.

The EGH shall be able to filter the “global” HGV based on rows in the AIT file if required as described in chapter 0.

The EGH shall provide the new “global” HGV according to the schedule for data exchange (see chapter 5) in the Out\New folder of all recipients (all TCs).

Each TC shall be able to download the “global” HGV from his Out\New folder on the EGH according to the schedule for data exchange (see chapter 5).

Each TC shall delete the “global” HGV from his Out\New folder on the EGH after the download.

Each TC may validate the correctness of the format and content of the global “HGV”.

The following rules shall be applied during validation:

The “global” HGV shall be delivered according to the schedule for data exchange (see chapter 5).

All mandatory fields shall be filled according to the format version defined in document 203.

The number of characters in each field shall be according to the format description.

No entries shall be present that should have been filtered according to the rules of the TC.

The TC may include a validation on the allowed change in the size of the HGV in his system and may stop the processing if the change in the size exceeds a certain limit.

The TC may include a validation on the number of OBE blocks resulting from the processing of the HGV in his system and may stop the processing if the number of OBE blocks exceeds a certain limit.

Each TC may report any errors in the file by sending an alarm message to the supervisor of the EGH by email.

Each TC may implement the received “global” HGV in his central system and use it for his purposes

3.3.4 HGC (120001)

The following procedures describe the handling of the white list confirmation (HGC) between originator, EGH and recipient.

The EGH shall be able to produce a HGV confirmation file (HGC) for each received “local” HGV

NOTE 1: The HGC shall contain only the header and footer records in case of a total rejection of the “local” HGV

NOTE 2: The HGC shall contain only the rejected lines in case of partial acceptance of the “local” HGV indicating for each line the reason of rejection

NOTE 3: A confirmation file (HGC) is produced and sent back to the TSP when the file is accepted or partial accepted. In case of total rejection of a HGV file no HGC file will be produced. The file will be placed in the TSPs rejected catalogue and an alarm will be send describing the failure. (See document 203 section 2.5.2 HGC)

The EGH shall provide the HGC according to the schedule for data exchange (see chapter 5) in the Out\New folder of the originator of the “local” HGV (TSP)

The TSP shall be able to download the HGC from his Out\New folder on the EGH

The TSP shall delete the HGC from his Out\New folder on the EGH after the download

The TSP shall initiate an appropriate error handling (e.g. solve the detected errors in his central system, send a new correct “local” HGV ...)

3.4 Transaction lists of Service Users

3.4.1 TIF (130001)

The following procedures describe the handling of the Transaction Information File (TIF) between originator, EGH and recipient.

A TC shall be able to produce a new TIF according to the format version defined in document 203 and upload it to his In\Temp folder of the EGH

The following rules shall be applied during production:

The central system of the TC shall have the capability to review transactions that come from the roadside, split them in transactions for local contracts and for foreign contracts (passages made with OBE from an EasyGo TSP) according to schedule for data exchange (see chapter 5)

The TC shall produce a TIF according to the format version defined in document 203 for each TSP separately

Pricing of each transaction and calculation of VAT shall be done by the TC either in his central system or at the RSE

All OBE transactions shall be checked against the NAT and AIT list and be found valid at the time of passing before they are included in the TIF

Separate TIFs shall be generated for debit and credit transactions

A TIF with credit transactions shall always be generated with a lower sequence number than the corresponding TIF with debit transactions to keep the sequence for partial refunds (R2→C3, see chapter 8.4).

The business rules for the TIF described in chapter 8 shall be observed

The TC shall ensure that the transactions are sent to the correct TSP

The TC shall have the ability to store transactions locally for a minimum period of 30 days in order to avoid any loss of transactions if no connection to the EGH can be established

The TC shall have the ability to manage incomplete transactions and enrich the data in order to send them as valid transactions in a TIF when data is insufficient

A TC shall move an uploaded TIF from his In\Temp folder to his In\New folder, when the upload is completed

The EGH shall validate each received TIF according to the following validation rules in addition to the general validation rules for the EGH described in chapter 3.1.1:

The PAN and the context mark in the in the TIF shall be defined in the BIN (+ BIN ext.) + context mark fields in the AIT.

Any breach of these rules has a total rejection of the TIF as a consequence

The EGH shall report any errors in the TIF by sending an alarm message to the originator of the file and to the supervisor of the EGH by email and move it from the In\New folder of the originator to the In\Rejected folder

The EGH shall move the TIF from the In\New folder of the originator to the In\Completed folder if the validation was successful but shall not send any confirmation by email

The EGH shall provide the TIF according to schedule for data exchange (see chapter 5) in the Out\New folder of the addressed recipient (TSP)

The TSP shall be able to download the TIF from his Out\New folder on the EGH

The TSP shall delete the TIF from his Out\New folder on the EGH after the download

The TSP shall process the downloaded TIFs in an ascending order (observing date and sequence number) and validate the correctness of the format and the content of the received TIF

The following rules shall be applied during validation:

All mandatory fields shall be filled according to document 203

The number of characters in each field shall be according to the format description

Each transaction may be checked against the NAT and AIT list to determine if they were valid at the time of passing.

If the OBE was valid at the time of passage, the TSP shall accept the transaction

The TSP may decline the transaction if the OBE was invalid at the time of passage

The TSP may accept any transaction without any precedence, when the OBE was invalid at the time of passing but has become valid in the meantime

The TSP shall produce a TIF confirmation file (TIC) based on the result of the validation and process it according to chapter 3.4.2

3.4.2 TIC (130001)

The following procedures describe the handling of the Transaction Information Confirmation (TIC) between originator, EGH and recipient.

A TSP who received a TIF shall produce a corresponding TIC

The following rules shall be applied during production:

One TIC is produced for each TIF received from each Toll Charger

The TIC shall reference the original TIF

The accepted number of transactions and amount (due) and rejected number of transactions and amount including VAT shall be stated in the header or footer record

Each rejected transaction shall be included as a body record including the reason of the rejection

If no transaction is rejected the TIC shall only contain a header and a footer record

A TSP shall upload the TIC to his In\Temp folder on the EGH according to the schedule for data exchange (see chapter 5)

A TSP shall move an uploaded TIC from his In\Temp folder to his In\New folder, when the upload is completed

The EGH shall validate each received TIC according to the general validation rules for the EGH described in chapter 3.1.1.

Any breach of these rules has a total rejection of the TIC as a consequence

The EGH shall report any errors in the TIC by sending an alarm message to the originator of the file and to the supervisor of the EGH by email and move it from the In\New folder of the originator to the In\Rejected folder

The EGH shall move the TIC from the In\New folder of the originator to the In\Completed folder if the validation was successful

The EGH shall provide the TIC according to schedule for data exchange (see chapter 5) in the Out\New folder of the addressed recipient (TC)

The TC shall be able to download the TIC from his Out\New folder on the EGH

The TC shall delete the TIC from his Out\New folder on the EGH after the download

The TC may validate the correctness of the format and the content of the received TIC

The following rules shall be applied during validation:

All mandatory fields shall be filled according to document 203

The number of characters in each field shall be according to the format description

The reason for each rejected transaction shall be stated

The TC shall correct any rejected transaction if possible or explain it to the TSP and resend it in a new TIF

The TSP shall invoice any non-rejected transactions to the Service User on behalf of the TC

3.4.3 FIF (130001)

The following procedures describe the handling of the Financial Information File (FIF) between originator, EGH and recipient. The body record in this file may to a large degree be filled as agreed bilaterally between TC and TSP.

A TC may produce a FIF if agreed with a TSP and upload it to his In\Temp folder on the EGH

The following rules shall be applied during production:

The TC shall produce a FIF within the frame according to the format version defined in document 203

The content of the body record shall adhere to the format agreed with the addressed TSP

A TC shall move an uploaded FIF from his In\Temp folder to his In\New folder, when the upload is completed

The EGH shall validate each received FIF according to the general validation rules for the EGH described in chapter 3.1.1

Any breach of these rules has a total rejection of the FIF as a consequence

The EGH shall report any errors in the FIF by sending an alarm message to the originator of the file and to the supervisor of the EGH by email and move it from the In\New folder of the originator to the In\Rejected folder

The EGH shall move the FIF from the In\New folder of the originator to the In\Completed folder if the validation was successful but shall not send any confirmation by email

The EGH shall provide the FIF according to schedule for data exchange (see chapter 5) in the Out\New folder of the addressed recipient (TSP)

The TSP shall be able to download the FIF from his Out\New folder on the EGH

The TSP shall delete the FIF from his Out\New folder on the EGH after the download

The TSP shall process the downloaded FIFs in an ascending order (observing date and sequence number) and validate the correctness of the format and the content of the received FIF

The following rules shall be applied during validation:

All mandatory fields shall be filled according to document 203

All mandatory fields shall be filled according to the bilateral agreement

The number of characters in each field shall be according to the format description agreed

The TSP shall produce a FIF confirmation file (FIC) based on the result of the validation and process it according to chapter 3.4.4

3.4.4 FIC (130001)

The following procedures describe the handling of the Financial Information Confirmation (FIC) between originator, EGH and recipient.

A TSP who received a FIF shall produce a corresponding FIC

The following rules shall be applied during production:

One FIC is produced for each FIF received from each Toll Charger

The FIC shall reference the original FIF

The accepted number of transactions and amount (due) and rejected number of transactions and amount including VAT shall be stated in the header or footer record if agreed.

Note that the amounts are netted as both debit and credit transactions are allowed within the same FIF.

Each rejected transaction shall be included as a body record including the reason of the rejection

If no transaction is rejected the FIC shall only contain a header and a footer record

A TSP shall upload the FIC to his In\Temp folder on the EGH according to the schedule for data exchange (see chapter 5)

A TSP shall move an uploaded FIC from his In\Temp folder to his In\New folder, when the upload is completed

The EGH shall validate each received FIC according to the general validation rules for the EGH described in chapter 3.1.1

Any breach of these rules has a total rejection of the FIC as a consequence

The EGH shall report any errors in the FIC by sending an alarm message to the originator of the file and to the supervisor of the EGH by email and move it from the In\New folder of the originator to the In\Rejected folder

The EGH shall move the FIC from the In\New folder of the originator to the In\Completed folder if the validation was successful

The EGH shall provide the FIC according to schedule for data exchange (see chapter 5) in the Out\New folder of the addressed recipient (TC)

The TC shall be able to download the FIC from his Out\New folder on the EGH

The TC shall delete the FIC from his Out\New folder on the EGH after the download

The TC may validate the correctness of the format and the content of the received FIC

The following rules shall be applied during validation:

All mandatory fields shall be filled according to document 203

All mandatory fields shall be filled according to the bilateral agreement

The number of characters in each field shall be according to the format description agreed between TC and TSP

The reason for each rejected transaction shall be stated

The TC shall correct any rejected transaction if possible or explain it to the TSP and resend it in a new FIF

3.5 Data exchange via generic files functionality

This function allows TCS and TSPs to exchange data via the EasyGo HUB without the EGH check

The following procedures describe the handling of the application data unit files (ADU) between originator, EGH and recipient.

Note that EasyGo has no requirements to the content of the file and therefore no description of the content in the file like header, body and footer.

Allowing generic files to flow through the EGH could represent a potential security issue, since the files could contain information which may not be in accordance with GDPR.

To ensure that EasyGo HUB fulfils the GDPR, it is required that all files sent through the EGH, containing sensitive information, must be encrypted.

Agreements regarding encryption and decryption must be agreed bilaterally between the two parties following the principles described in document 205 "*Key distribution*".

The validation performed by the EGH will only look at the file name. The following rules shall be applied during production where the EasyGo HUB will perform the following validations:

1. Duplicate check of filename
2. Valid originating actor
3. Valid receiving actor
4. Structure of filename

In case a file does not pass the validation, it is placed in the "Reject" folder of the sender/originator. It may be considered to send an email to the sender.

4 Monitoring, statistics and QA

4.1 Logging and storing of data

4.1.1 Logging of data

All data file exchange operations are logged in the EGH with the following data:

ActorID of originator

ActorID of recipient

Data file name

Data file type

Date and time received

Data and time sent/forwarded

Result of check (accepted/rejected)

The EGH extracts additional information from files to support operation survey, general statistic and QA monitoring. This is done within the restrictions defined by the EU data protection legislation/GDPR. The EGH reads and stores the following information from:

ACT, AIT and TST:

ID (File name and list name)

Originator of file (TC, TSP or EGH)

Date of file

Result of file check (accepted/rejected)

Number of records in list

NAT/NAC and HGV/HGC:

ID (File name and list name)

Originator of file (TC, TSP or EGH)

Date of file and list (NAT/HGV)

Result of file check (accepted/partial acceptance/ total rejection/reason of rejection)

Number of records (accepted/rejected/reason of rejection)

Date of file and list of corresponding (NAC/HGC)

Number of records grouped by day and reason of blocking (NAT)

TIF/TIC:

ID (File name and list name)

Originator of file (TC, TSP)

Date of file (TIF)

OBE divided on product code, Context Mark or BIN number where relevant

Lane identification

Type of toll lane

Type of transit

Number of records and amounts

Result of file check (accepted/rejected/reason of rejection)

Date of file and list of corresponding (TIC)

Number of records and amounts (accepted/rejected/reason of rejection)

Number and amounts of accepted transactions grouped per day, type of toll lane and type of transit (TIF-TIC)

Number and amounts of rejected transactions grouped per day, type of toll lane and type of transit and reason of rejection (TIF-TIC)

FIF/FIC

ID (File name and list name)

Originator of file (TC, TSP)

Date of file (FIF)

Number of records

Result of file check (accepted/rejected/reason of rejection)

Date of file and list of corresponding (FIC)

4.1.2 Storing of data

NAT, NAC, HGV and HGC only include validation data necessary to confirm validity and pricing. The EGH stores valid data content from the latest received HGV and NAT list in tables. Data content in HGC and NAT/NAC are not stored in tables as only the files are stored according to 2.4.2.

As TIF, TIC, FIF and FIC contain user data from which a user pattern can be derived the data stored is either aggregated sum data or anonymised before relevant data from the TIF/TIC is stored in tables. No data from FIF and FIC files are stored in tables.

The tables with data from NAT and HGV include all body records.

The tables with data from NAC and HGC include only rejected records.

TIF, TIC, FIF and FIC contain user data from which a user pattern can be derived while NAT, NAC, HGV and HGC only include validation data necessary to confirm validity and pricing. See also chapter 2.4.2.

For data exchange between TCs and TSPs using the ADU file exchange, the EGH shall not store data unless the data is addressed to the EGH. This may be relevant in the future regarding i.e. _efcContextData. Note that, in phase 1, it is not foreseen that files are addressed to EGH.

4.2 Monitoring of operation

The EGH keeps a register where the status of all files received is displayed.

Name of the file

Status – no reply yet, accepted partial acceptance or total rejection

Reason of rejection

Based on this the supervisor follows up if a TC/TSP or the EGH fails to reply on the files sent to him on time according to the schedule for data exchange (see chapter 5) as described in chapter 7.2.

If a TSP/TC or the EGH detects any failure the supervisor of the EGH is contacted.

Oversigt over transaktionslister

Udsteder: 30C006 - Turistbetaling Noi, 30C007 - Fjellinen AS, 30C008 - Trøndelag Bomve, 30C009 - Tungenes Ferjete

Operator: 100007 - Fjellinen AS, 100008 - Trøndelag Bomvei, 100009 - Tungenes Ferjete, 100010 - Hvalertunnelen AS

Transaktionsliste: Ikke kvit. transaksjon

Fra dato: 01-08-2010, Til dato: 20-12-2010

Vis antall resultater: 1000, Der blev fundet 12 resultater.

Buttons: Vis på skærm, Vis i Excel, Nulstil, Annuller filer, Fjern annullering

Operator	Operatørnr	Udsteder	H4sfedevnr	Transaktionsliste	Import dato	Kvitteringsdato	Antal V1	Bel V1	Acc Ant V1	Acc Bel V1	Avv Ant V1	Avv Bel V1	V1
Scandines Deutschland GmbH	250001	Scandines AB	A40005	TF2500012010121101	11-12-2010 06:05		1	80,00					EUR
Scandines AB	400003	Svinesundsforbindelsen AS	30C00A	TF4000032010121900	20-12-2010 00:00		4	1.464,00					SEK
Scandines AB	400003	Fjellinen AS	30C007	TF4000032010121900	20-12-2010 00:00		14	5.124,00					SEK
Scandines AB	400003	Østfold bompengeselskap as	30C01E	TF4000032010121900	20-12-2010 00:00		1	366,00					SEK
A/S Storebætt (O)	200001	Fjellinen AS	30C007	TF2000012010122001	20-12-2010 01:30		9	3.258,50					DKK
A/S Storebætt (O)	200001	Tensberg Hovedveifnans AS	30C027	TF2000012010122001	20-12-2010 01:30		3	627,00					DKK
Scandines Danmark A/S	200004	Fjellinen AS	30C007	TF2000042010122001	20-12-2010 06:05		3	1.797,00					DKK
Scandines Deutschland GmbH	250001	Fjellinen AS	30C007	TF2500012010122001	20-12-2010 08:05		2	160,00					EUR
Øresundsbrokonsortiet	400001	Tensberg Hovedveifnans AS	30C027	TF4000012010122010	20-12-2010 07:05		3	1.068,75					SEK
Øresundsbrokonsortiet	400001	Østfold bompengeselskap as	30C01E	TF4000012010122007	20-12-2010 07:05		9	3.600,00					SEK
Øresundsbrokonsortiet	400001	Fjellinen AS	30C007	TF4000012010122001	20-12-2010 07:05		25	13.862,50					SEK

Figure 4: Statistics on the EasyGo HUB

Filtrering af alarmer

Fra dato: DD-MM-AAAA, Til dato: DD-MM-AAAA, Behandlede:

AkterID: , Filtype: HGVLlist, Beskrivelse:

Buttons: Filtrér, Nulstil

ActnrID	Filmavn	Tidspunkt	Beskrivelse	Behandlet	Slet
900000	HGV9000002010100601	06-10-2010 13:16:07	The following errors occurred validating HGV9000002010100601 A file with this filename has been seen once	<input type="checkbox"/>	Slet
978003	HGV9780032009111601	17-11-2009 10:04:29	The following errors occurred validating HGV9780032009111601 A file with this filename has been seen once	<input type="checkbox"/>	Slet
978003	HGV9780032009110201	03-11-2009 08:52:55	The following errors occurred validating HGV9780032009110201 A file with this filename has been seen once	<input type="checkbox"/>	Slet
978003	HGV9780032009110201	03-11-2009 00:13:44	Error updating DB with HGV list from 978003 Exception: Timeout expired. The timeout period elapsed prior to completion of the operation or the server is not responding. The statement has been terminated.	<input type="checkbox"/>	Slet
978003	HGV9780032009102701	28-10-2009 11:36:50	The following errors occurred validating HGV9780032009102701 A file with this filename has been seen once	<input type="checkbox"/>	Slet
978003	HGV9780032009102001	21-10-2009 00:21:39	The following errors occurred validating HGV9780032009102001 A file with this filename has been seen once	<input type="checkbox"/>	Slet

Figure 5: Alarm handling on the EasyGo HUB

Alarm overview on the EGH showing the originator of the file (TSP Storebælt 978003), actual filter (HGV) description and treated or delete. The alarm is sent to the supervisor of the EGH and the relevant originator.

4.3 QA and statistics

The QA and statistic are based on the content of the files exchanged through the EGH. This is currently accessible by the EGH supervisor which shall provide the TCs, TSPs and EasyGo interoperability management with the relevant data on a monthly basis in line with the EasyGo quality system defined in document 307 or immediately when the supervisor detects cases which need action from the TC or TSP.

4.4 ADU statistics and WEB interface

All files are registered, so that the EGH knows what files have been sent through, to and from whom and the result of the validation. The administrative WEB interface will be updated in the EGH, so administrative personnel are able to search for the ADU files by choosing the same parameters as for the standardised files.

Generic files							
Sender	File name	Direction	Timestamp	Records *)	Type	Validering	Rejected
200001	ADU200001201711070001_978003_Y		07/11/2017 12.12		ADU	V	No
978003	ADU978003201711070001_200001_Y		07/11/2017 13.00		ADU	V	No
978003	ADU978003201711010001_200001_Y_trustObject		01/11/2017 12.14		ADU_trustObject	V	No
978003	ADU978003201711010001_400002_Y_retrieveQA		01/11/2017 12.15		ADU_retrieveQA	V	No
978003	ADU978003201711010001_400002_Y_retrieveQA		01/11/2017 12.16		ADU_retrieveQA	-	Yes

*) records are not possible to register in the encrypted files. If possible, the size could be noted for these files.

5 Schedule for data exchange

5.1 General

This chapter describes which data / tables must be available or exchanged at which times and when they shall be updated. The description is divided into three categories:

1. Prerequisites for testing
2. Static data / parameter tables (ACT, TST and AIT)
3. Validation and transaction data exchanged on a daily basis

The requirements are valid for toll chargers, toll service providers and the EasyGo HUB.

5.2 Prerequisites for testing

5.2.1 New toll charger or changes made for existing toll charger

When a new TC shall commence operation, the table below shows what data must be available at what times (and some other prerequisites):

Phase	Start	Finish	Requirements /Comments
Accepted as new TC (incl. service recipients) <ul style="list-style-type: none"> • Establish activity plan incl. time schedule ($T_0 - T_6$) • Access to EGH – test and production environment • Establish VPN connection • Establish folders etc. • Enter own data in ACT and TST 	T_0	$T_1 = T_0 + 30 \text{ d}$	EGH requires one month for these tasks ACT, AIT, NAT and HGV are made available to the TC in this period TC must enter own data in ACT and TST A new TC shall be included in the valid ACT table 14 days before sending the first TST. The TST shall be provided 7 days before any TIF are sent
Necessary preparations by TC	T_1	$T_2 = T_1 + 30 \text{ days}$	
INT1 / INT2	T_2	$T_3 = T_2 + 45 \text{ days}$	TC requires OBEs from TSPs for these tests Optionally, this can be done by simulating transactions (i.e. with “virtual” OBEs on NAT and HGV in test environment) as well
E2E test environment	T_3	$T_4 = T_3 + 30 \text{ days}$	
E2E production environment	T_4	$T_5 = T_4 + 30 \text{ days}$	Requires that TSP has registered TST of new TC before start of test
Trial operation	T_5	$T_6 = T_5 + 30 \text{ to } 90 \text{ days}$	Requires recruitment of “friendly” users before start
Start of operation	T_6	-	

T₀ – T₆ are indications of how long each phase will take.

A detailed check list can be found in document 206 “*EasyGo test strategy*”.

If an existing TC shall make changes to its RSE or CS the extent of testing will depend on the complexity of the change. The following needs to be done/agreed:

- Agree on time schedule
- Update ACT and TST if relevant
- How long before the initiation of tests must the new ACT and TST be available to the EGH and TSPs

5.2.2 New toll service provider or changes made for existing toll service provider

When a new TSP shall commence operation, the table below shows what data must be available at what times (and some other prerequisites):

Phase	Start	Finish	Requirements /Comments
<ul style="list-style-type: none"> • Accepted as new TSP (also service recipients) • Establish activity plan including time schedule (T₀ – T₆) • Access to EGH – test and production environment • Establish VPN connection • Establish folders etc. • Enter own data in ACT and AIT • tests are performed to ensure the correctness of format and data 	T ₀	T ₁ = T ₀ + 30 d	EGH requires one month for these tasks TSP to enter own data in ACT and AIT A new TSP shall be included in the valid ACT table 14 days before sending the first AIT. TSP extending to additional TC is to be regarded as new in relation to these TC. The AIT shall be provided 7 days before any HGV or NAT are sent ACT and TST are made available in this period
Necessary preparations by TSP	T ₁	T ₂ = T ₁ + 30 days	
INT1 / INT2	T ₂	T ₃ = T ₂ + 45 days	Requires OBEs to be read by TCs/RSE (test agreements) Optionally, this can be done by simulating transactions (i.e. with “virtual” OBEs on NAT and HGV in test environment) as well
E2E test environment	T ₃	T ₄ = T ₃ + 30 days	
E2E production environment	T ₄	T ₅ = T ₄ + 30 days	Requires that TC has registered AIT of new TSP before start Tests on production environment require real/productive OBEs See also document 206

Trial operation	T ₅	T ₆ = T ₅ + 30 to 90 days	Requires recruitment of “friendly” users
Start of operation	T ₆	-	

A detailed check list can be found in document 206.

If an existing TSP shall introduce a new OBE or make changes to his CS the extent of testing will depend on the complexity of the change. The following needs to be done/agreed:

- Agree on time schedule
- Update ACT and/or AIT if relevant
- How long before the initiation of tests must the new ACT and/or AIT be available to the EGH and TCs?
- How long before a TSP shall distribute new OBEs to service users do the TCs require test OBEs from the TSP?

5.3 Parameter tables

The tables below show the static parameters tables ACT, TST and AIT. These tables are only updated when a change is made by a TC, a TSP or the EGH.

Day zero -0- is the day the EGH makes the new global table available after a TC or TSP has sent a local change to the table.

All files shall be validated within 10 minutes after reception.

It should be noted that not all TCs and TSPs receive the full global ACT, TST or AIT as they may decide to receive only filtered versions of the tables. For example, ASFINAG does not receive AIT for EasyGo Basic TSPs. See chapter 3.1.3. (These are production system requirements. For test system see test documentation.

Actor table (ACT)	Time – CET/CEST
<p>Each TC /TSP shall send any changed data for the ACT to the EGH if an update is required</p> <p>The changed information can be sent to the EGH operation team as email or as an ACT file.</p>	Latest 12:00 day - 7
EGH operation team will check the received data and update the global ACT within 7 days accordingly	Latest 12:00 day 0
The EGH shall update the new global ACT and provide it for download.	Latest 20:00 day 0
<p>Each TC/TSP shall download the new global ACT from the EGH.</p> <p>If more than one ACT is available for download, only the latest version is valid. Any previous versions shall be disregarded.</p>	Earliest 20:30 day 0
Each TC/TSP shall validate his own data in the new global ACT if an update was sent to the EGH	Preferably before 06.00 day 1 but no later than 6:00 day 9
Each TC/TSP shall use the new global ACT	Earliest 6:00 day 1 Latest 6:00 day 10

Toll station table (TST)	Time – CET/CEST
Each TC shall upload a local TST to the EGH any time an update is required	Any time but latest 17:30 day 0
The EGH shall compile a new global TST and provide it for download in the Out/New folder of all TSPs	If new data are received a file is send at Hours 00, 06, 12 and 18 Day 0 (to avoid numerous TST when more than on TC has an update)
The originator of the updated local TST shall download the new global TST from the EGH	Max. 30 minutes after uploading
The originator of the updated local TST shall validate his own data in the new global TST	Latest 19.00 day 0
In the case of an error in the new global TST, a corrected local TST has to be sent to the EGH	Latest 20.00 day 0

Each TSP shall download the new TST from the EGH. If more than one global TST is available for download, only the latest version is valid. Any other previous version may be disregarded.	Earliest 20:30 day 0
Each TC may validate its input to the global TST A TSP may check the table for correctness	Preferably before 06.00 day 1 but no later than 6:00 day 4
Each TSP shall use the new global TST	Earliest 6:00 day 1 Latest 6:00 day 5

Accepted issuer table (AIT)	Time – CET/CEST
Each TSP shall upload its local AIT to the EGH any time an update is required. The EGH operation team must be informed if there are changes for the filtering.	Any time but latest 17:30 day 0
The EGH shall compile a new global AIT and provide it for download in the Out/New folder of all TCs. EGH operation team will check the received data and update the global ACT within 3 days accordingly.	If new data are received a file is send at Hours 00, 06, 12 and 18 (to avoid numerous TST when more than on TC has an update) Latest 12:00 day 3
The originator of the updated local AIT shall download the new global AIT from the EGH	Max. 30 minutes after uploading
Each TSP shall validate his own data in the downloaded AIT if an update was sent to the EGH	Latest 19.00 day 0
In the case of an error in the downloaded global AIT a corrected local AIT has to be sent to the EGH	Latest 17.30 day 1
Each TC shall download the new global AIT from the EGH. If more than one global AIT is available for download, only the latest version is valid. Any other previous versions may be disregarded.	Earliest 20:30 day 0
<u>Central system</u> Each TC may check the new global AIT and report errors to EGH	Preferable before 06.00 day 1 but no later than 6:00 day 7
<u>Central system</u> Each TC shall use the new global AIT	Earliest 6:00 day 1 Latest 6:00 day 7

<u>Road Side Equipment</u>	Earliest 6:00 day 1
Each TC shall use the new global AIT	Latest 6:00 day 30

5.4 Validation- and transaction lists

The table below shows the validation- and transaction tables which are exchanged on a daily basis.

It is a prerequisite that all static tables ACT, TST and AIT have been distributed/installed before validation and transaction lists can be exchanged.

In general, all files shall be validated within 10 minutes after reception unless otherwise stated for HGV- and NAT-files.

Validity Lists of Service Users	Time – CET/CEST Time
Each TSP shall upload the local validity lists to the EGH with one hour in between NAT HGV	The upload of the NAT shall be completed: Latest 20:00 day 0 and the HGV: Latest 21.00 day 0
The EGH shall validate the local validity lists of each TSP and send a confirmation that the HGV and NAT have been accepted (NAC/HGC)	Max. 30 minutes after reception
The EGH shall compile a global NAT global HGV and provide them for download	NAT: Latest 21:00 day 0 HGV: Latest 22:00 day 0
Each TC shall download and use the global NAT global HGV from the EGH	NAT: Earliest 23:30 day 0 HGV: Earliest 00:30 day 1
Each TC shall use the new validity lists	Latest 06:00 day 1
Optionally report any errors in the global NAT global HGV by email to the supervisor of the EGH	Latest 09:00 day 1

The EGH solve / detect and inform of problem of a corrupt global NAT global HGV	Latest 17:00 working day 1
Transaction lists of Service Users	
Each TC may upload a Transaction Information File (TIF) and/or Financial Information File (FIF) to the EGH	Latest 06:00 day 0
The EGH shall provide the Transaction Information File (TIF) and/or Financial Information File (FIF) for download for each TSP	Latest 06:30 day 0
Each TSP shall check for any Transaction Information File (TIF) and/or Financial Information File (FIF) to download in the correct sequence (1, 2, 3...)	Earliest 06:30 day 0 Latest 09:00 day 0
Each TSP shall upload a TIF confirmation (TIC) and/or FIF confirmation File (FIF) to the EGH	Latest 09:30 day 0
The EGH shall provide the TIF confirmation (TIC) and/or FIF confirmation file (FIC) for download to the TC	Latest 10:00 day 0
Each TC shall check for any TIF confirmation (TIC) and/or FIF confirmation file (FIC) to download in the correct sequence	Latest 10:30 day 0
Each TC may upload a Transaction Information File (TIF) and/or FIF more frequent to the EGH if agreed with the recipient (TSP). The TSP may upload a TIF confirmation (TIC) and/or FIC to the EGH more frequent if agreed with the originator of the TIF/TIC file (TC). The EGH will check and transfer additional files within 30 min. except during a service window.	The EGH provides any TIF/TIC or FIF/FIC within 30 min.

General rules	
Service window (No files shall be transferred through the EGH)	Every Wednesday 12:00-16:30
If the EGH detects an error in any of the files, an alarm shall be automatically generated by the EGH and sent to the relevant actor(s) by email according to the validation rules (see chapter 3.1).	Ad hoc

6 Validation rules and responsibility (Transaction level)

6.1 General

The Parameter tables and the Validity lists of Service Users are valid from their availability for download until new ones are provided for download

Based on an agreed schedule for data exchange (chapter 5), it is determined which Parameter tables and Validity lists of Service Users are valid at the time of passing. These lists are used to determine if each transaction is valid or not.

The responsibility of a TC not receiving payment for transactions usually lies either with a TSP or the TC himself. In some cases, if technical failures occur, the EGH might be responsible. This is usually due to the cases where a TSP has delivered the correct Validity list of Service Users in due time, where the EGH has acknowledged them but has not been able to forward it to the TC in due time.

6.2 The TCs control of OBEs at the charging point

The TC shall reject a transaction with an OBE when:

The OBE is not issued by a registered and valid TSP (identified through the EFC context mark on the AIT file)

The OBE is found on the NAT file valid at the time of the passage

The TC shall note in the TIF file for each transaction which NAT file has been used when validating and accepting the OBE (zeros (“0”) are filled in if no NAT file has been used).

It is not a requirement to use a NAT file to carry out a transaction, but the TC must be aware that he bears the responsibility if the TSP rejects the transaction. The TSP cannot, however, reject the transaction if the OBE was valid at the time of passage.

The transaction is valid if:

The OBE is issued by a registered and valid TSP (identified through the EFC context mark on the AIT file)

The OBE is not found on the NAT file valid at the time of the passage

The OBE was on the NAT file but was rejected by the EGH using a NAC file

The transaction is forwarded from the TC within the time limit defined in clause 6.2 of the TSPA for each type of transaction C1 – C8

6.3 Wrongful rejection by TC

In some cases, an incorrect rejection may occur at the charging point when for example a wrong NAT file has been used.

Incorrect rejections may be divided into the following:

Passage has been paid by other means

At charging points with barriers, a rejected user will be able to pay by other means.

ASFINAG: At charging points without barriers, a rejected Service User is obliged to make a retroactive payment by any accepted means (stated in the Austrian Tolling Regulations).

A passage without payment has occurred

ASFINAG: At charging points without barriers, a rejected Service User is obliged to make a retroactive payment by any accepted means (stated in the Austrian Tolling Regulations).

If the Service User do not use this mandatory step, the non-payment of this transaction will lead to a penalty of toll evasion.

At free flow charging points, some incidents will be passages where no valid OBE has been registered. If the user is not recognised via his license plate as having a valid contract, an invoice will be sent to the registered vehicle owner. If the invoice was issued due to an error, it should be reimbursed and an EasyGo transaction, with the amount due for the previously rejected transaction, should be sent to the TSP as a converted debit transaction (C7/D7). This option is not valid for ASFINAG.

The processes above are described in document 403 in the following processes:

- Process 5.2.4 describes “*Correcting “wrongful” collection by TC*” which is valid in free flow systems when the TCs invoices the SU directly even if the SU had a valid contract at the time of passage
- Process 5.2.5 describes “*Retroactive payment*” which is mandatory in Austria if the driver detects that the correct fee has not been paid when passing a charging point. If a central solution is available, the SU has to contact his TSP to perform the retroactive payment on his behalf.

6.4 TSP's verification of transactions in the TIF file

The TSP shall not reject a valid EasyGo transaction received in the TIF file. The verification of the transaction is done in the TSP's Central System and he may reject a transaction if one of the following criteria is met:

- a. The OBE is on the NAT file valid at the time of passage and was not rejected by the EGH
- b. The transaction is sent to the TSP after the time limit defined in clause 6.2 of the TSPA for each type of transaction *)
- c. The BIN + BIN ext. + context mark of the OBE is not on the AIT valid at the time of passage
- d. The transaction is sent from a TC not being a part of the EasyGo Joint Venture or a TC service recipient.
- e. The transaction in the TIF contains a syntactic or semantic error
- f. Full or partial credit of a transaction not previously received by the TSP
- g. The transaction has already been received

*) Note that the TSP must have the ability to change the time limit for receiving transactions if so agreed for each type of transactions

6.5 Handling of rejected transactions

Rejected transactions shall be included in the TIC along with a specification of the reason of the rejection. The TC shall check the rejected transactions and may make the necessary corrections to any errors or explain the reason of the transaction being sent in this manner and resend the transactions.

Rejected transactions shall be handled and resent by the TC as soon as possible. If a transaction is rejected for a second time, the TC and TSP shall agree to a new resending in advance to avoid further automatic rejections.

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7 EasyGo HUB specific requirements

7.1 Technical and operational requirements

The EGH shall be connected to an Internet infrastructure with sufficient capacity to ensure the data exchange within the given time schedule. This also applies for each actor connecting to the EGH.

The EGH shall supply a firewall-based VPN tunnelling interface based on best practice standards and specify configuration guidelines for actors on how to connect to the EGH.

Each TC and each TSP can only have one VPN connection to the EGH. Details are described in document 208 “*Requirements for VPN access to the EasyGo HUB*”

The file exchange shall use FTP. Each communication partner should have a FTP-client installed, and each communication partner shall have a dedicated home directory on the EGH’s FTP server.

The EGH shall support delivery of the following services:

- Daily administration of the EGH including monitoring of daily operation
- Participation in test activities (new actors, changes etc.)
- Management of development projects in the EGH environment

The EGH shall be administered according to best practice with regards to IT security related issues. This includes (but is not limited to):

- Physical and logical access
- Backup/recovery
- User administration (authentication, authorization etc.)

The EGH shall have a test environment separated from the production environment. In addition, a development system is available for EGH but not available for TC and TSP. The test environment must have the capability to replace the production and function as backup until the production environment is up and running.

In case of production environment outages of any kind, a fully functional production environment must be re-established within one week. The replacement of the current solution is expected within 48 hours. If needed it is fully acceptable to use components from the test environment to guarantee emergency operation of the production environment. This may result in the test environment becoming unavailable. If a test environment has become unavailable, it must re-establish within one month from the date where the production environment broke down at latest.

These requirements are regulated in 006 EasyGo IT Services Agreement and S&B EasyGo Emergency recovery process.

7.2 Warnings

To secure the reliability and quality of data exchange the EGH shall have functions for issuing alarms and warnings if errors or unexpected situations in the data exchange occur.

The EGH shall be provided with a message system which makes it possible to generate and issue warnings/alarms to one or several predefined recipients (supervisor(s), system operator(s) or other actors). This may be both internal users and/or other actors. It must be possible to address a message to more than one recipient.

A message type must be defined by parameters such as fixed descriptive text, variable text/data, title, message type, actors that are affected by the alarm etc.

Addresses/recipients for messages must be set up from the ACT Table.

The EGH shall produce error/warning messages when situations occur that can/will impact daily operation. These errors can be divided into the following groups:

System related issues (Mails shall be sent to EGH operational staff and, when applicable, to actors)

File related issues (Mails shall be sent to actors)

The message system shall be based on email and a log system accessible for the operational staff of EGH.

8 Business rules for TIF

8.1 General rules for the transaction codes

In order to facilitate the TCs different requirement for invoicing it has been necessary to introduce a number of types of transit for the distinction of transaction lines in the TIF. The Cx, Dx and E1 codes are used for debit transaction and the R2, S2 and T1 codes respectively are used for credit transaction, where x is always a number with a value from 1 to 9. The meaning of each code is described below.

The functional description of each of the Cx codes can be found in chapter 2.3 in document 307 “EasyGo quality system”.

The Cx, Dx and E1 codes of debit and Rx, Sx and T1 codes of credit transactions are used as follows:

1. If all information regarding a Billing detail (transaction) can be given in one line (including VAT) only one record using the code Cx is used for debit transactions and the code Rx for credit transactions.
2. All information regarding a Billing detail (transaction) with mixed VAT rates shall be divided in several lines to cover the different VAT rates for each part of the transaction. In these cases, there will be one record with the code Cx and additional record(s) with the code Dx containing the parts of the transaction with different VAT rates.

The Cx-record shall have a unique ActorID, Entry/Exit Station codes, Lane identification and Date and time of transit for a transaction. Each Cx-record shall have a unique TC-transaction identification pr. Actor ID. The remaining services with one or more different VAT rates will be included in separate Dx-records which shall have the same ActorID, Entry/Exit Station codes, Lane identification, Date and time of transit and TC-transaction identification as the corresponding Cx-record. Each Cx and Dx line shall be represented as a separate line on an invoice if they are not aggregated into an E1 record.

The codes Rx and Sx are used for crediting such transactions in the same manner stating the ActorID, Entry/Exit Station codes, Lane identification, Date and time of transit and TC-transaction identification of the original Cx-record. All records of a transaction with mixed VAT rates shall be credited together and shall be represented as a separate line on an invoice if they are not aggregated into a T1 record.

3. All Billing details (Cx/Dx-record(s)) for the same OBE, PAN and VAT rate within one calendar day may be aggregated into one or more aggregated E1 records with a unique identifier (Reference number) to reduce the number of lines to be represented on an invoice and avoid rounding differences. This Reference number is associated to the generated aggregate (E1-record) and each of the Billing details (Cx/Dx-record(s)) it is stemming from in the field “Invoice transaction aggregation number”.

If one of the aggregated Billing details consists of more than one record with different VAT rates, the aggregation is done separately for the Cx-records and all the Dx-records with different VAT rates.

The aggregation of Rx and Sx records is done in the same manner. They are aggregated into one or more T1 records with different VAT rates.

8.2 C1/D1 record

8.2.1 Use

A C1 record is used to transmit a normal successful DSRC Billing detail registered by the RSE from the TC to the TSP. All information regarding this transaction can be given in one line (including VAT).

Information regarding a Billing detail with mixed VAT rates shall be divided in several lines to cover the different VAT rates for each part of the transaction. In these cases there will be one record with the code C1 and additional record(s) with the code D1 containing the parts of the transaction with different VAT rates.

A TC cannot send a C1 and a C8 for the same OBE and location at the same time where both include values. If both transactions are sent one of them must be with zero value. If there is a time difference between the C1 and C8 it is probably two transactions where one is identified via license plate (C8) and the other via the OBE (C1).

8.2.2 Aggregation

If the C1/D1 record(s) are aggregated, they shall only contain the technical information (e.g. Authenticators, exact location of the transaction, net amount ...) and the field "Fee (VAT included)" shall be filled with zeros (0).

For details on the aggregation see E1 record.

8.2.3 Non-acceptance by TSP

If a TSP concludes that the sent C1/D1 record(s) are not correct, he may decline them by the use of the TIC file. All C1 record(s) and D1 record(s) belonging to the same Billing detail shall be rejected together if an error in one part is detected. In this case the reason for the rejection shall be included in the field "Reason of rejection EasyGo".

8.2.4 Refund

There are **three** cases to distinguish if Billing details transmitted through C1/D1 record(s), which were not declined by a TSP, need to be refunded (at a later time):

For a full refund of a Billing detail the C1/D1 record(s) shall be refunded by R2/S2 record(s) (C1/D1 → R2/S2)

For a partial refund of a Billing detail the C1/D1 record(s) shall be refunded by R2/S2 followed by a new corrected transaction C3/D3 (C1/D1 → R2/S2 → C3/D3)

For a partial refund of a Billing detail to specify a discount not part of the price specified in the C1/D1 record(s) it shall be followed by refund R2/S2 stating the discount. (C1/D1 → R2/S2)

8.2.5 Resending

If a TC needs to resend previously rejected C1/D1 record(s), he shall issue C3/D3 record(s). If any changes were agreed between TC and TSP (e.g. changed amount) they have to be applied in this step.

8.2.6 Quality framework

C1/D1 record(s) are considered as complete and correct transactions “TX_{comp}” in the sense of the quality framework described in document 307.

8.3 C2/D2 record

8.3.1 Use

A C2 record is used to transmit a manually keyed-in Billing detail registered in the lane as a fall-back solution from the TC to the TSP. All information regarding this transaction can be given in one line (including VAT).

Information regarding a Billing detail with mixed VAT rates shall be divided in several lines to cover the different VAT rates for each part of the transaction. In these cases, there will be one record with the code C2 and additional record(s) with the code D2 containing the parts of the transaction with different VAT rates.

8.3.2 Aggregation

If the C2/D2 record(s) are aggregated, they shall only contain the technical information (e.g. Authenticators, exact location of the transaction, net amount ...) and the field “Fee (VAT included)” shall be filled with zeros (0).

For details on the aggregation see E1 record.

8.3.3 Non-acceptance by TSP

If a TSP concludes that the sent C2/D2 record(s) are not correct, he may decline them by the use of the TIC file. All C2 record(s) and D2 record(s) belonging to the same Billing detail shall be rejected together if an error in one part is detected. In this case the reason for the rejection shall be included in the field “Reason of rejection EasyGo”.

8.3.4 Refund

There are **three** cases to distinguish if Billing details transmitted through C2/D2 record(s), which were not declined by a TSP, need to be refunded at a later time:

For a full refund of a Billing detail the C2/D2 record(s) shall be refunded by R2/S2 record(s) (C2/D2 → R2/S2)

For a partial refund of a Billing detail the C2/D2 record(s) shall be refunded by R2/S2 followed by a new corrected transaction C3/D3 (C2/D2 → R2/S2 → C3/D3)

For a partial refund of a Billing detail to specify a discount not part of the price specified in the C1/D1 record(s) it shall be followed by refund R2/S2 stating the discount. (C1/D1 → R2/S2)

8.3.5 Resending

If a TC needs to resend previously rejected C2/D2 record(s), he shall issue C3/D3 record(s). If any changes were agreed between TC and TSP (e.g. changed amount) they have to be applied in this step.

8.3.6 Quality framework

C2/D2 record(s) are considered as manually entered transactions “TX_{bar}” in the sense of the quality framework described in document 307.

8.4 C3/D3 record

8.4.1 Use

A C3 record may be used to transmit a corrected Billing detail where changes had to be applied (e.g. changed amount) to get it accepted. All information regarding this transaction can be given in one line (including VAT).

Information regarding a Billing detail with mixed VAT rates shall be divided in several lines to cover the different VAT rates for each part of the transaction. In these cases, there will be one record with the code C3 and additional record(s) with the code D3 containing the parts of the transaction with different VAT rates.

8.4.2 Aggregation

If the C3/D3 record(s) are aggregated, they shall only contain the technical information (e.g. Authenticators, exact location of the transaction, net amount ...) and the field “Fee (VAT included)” shall be filled with zeros (0).

For details on the aggregation see E1 record.

8.4.3 Non-acceptance by TSP

If a TSP concludes that the sent C3/D3 record(s) are not correct, he may decline them by the use of the TIC file. All C3 record(s) and D3 record(s) belonging to the same Billing detail shall be rejected together if an error in one part is detected. In this case the reason for the rejection shall be included in the field “Reason of rejection EasyGo”.

8.4.4 Refund

There are two cases to distinguish if already corrected Billing details transmitted through C3/D3 record(s), which were not declined by a TSP, need to be refunded at a later time:

- For a subsequent full refund (= cancellation) of a Billing detail the C3/D3 record(s) shall be refunded by R2/S2 record(s) (... → R2/S2 → C3/D3 → R2/S2)
- For further partial refunds of an already corrected Billing detail the C3/D3 record(s) shall be refunded by R2/S2 followed by a new corrected transaction C3/D3 (... → R2/S2 → C3/D3 → R2/S2 → C3/D3 ...)

8.4.5 Resending

If a TC needs to resend previously rejected C3/D3 record(s), he shall issue C3/D3 record(s). If any changes were agreed between TC and TSP (e.g. changed amount) they have to be applied in this step.

8.4.6 Quality framework

C3/D3 records are not regarded in the quality framework as they are mainly used for resending of record(s) after rejection and corrections of amounts of all Cx/Dx record(s) and can thus not be distinguished.

8.5 C4/D4 record

8.5.1 Use

A C4/D4 record is used to transmit a virtual (artificial) Billing detail generated in the central system of the TC. All information regarding this transaction can be given in one line (including VAT).

Information regarding a Billing detail with mixed VAT rates shall be divided in several lines to cover the different VAT rates for each part of the transaction. In these cases, there will be one record with the code C4 and additional record(s) with the code D4 containing the parts of the transaction with different VAT rates.

8.5.2 Aggregation

If the C4/D4 record(s) are aggregated they shall only contain the technical information (e.g. Authenticators, exact location of the transaction, net amount ...) and the field "Fee (VAT included)" shall be filled in with zeros (0).

For details on the aggregation see E1 record.

8.5.3 Non-acceptance by TSP

If a TSP concludes that the sent C4/D4 record(s) are not correct, he may decline them by the use of the TIC file. All C4 record(s) and D4 record(s) belonging to the same Billing detail shall be rejected together if an error in one part is detected. In this case the reason for the rejection shall be included in the field "Reason of rejection EasyGo".

8.5.4 Refund

There are two cases to distinguish if Billing details transmitted through C4/D4 record(s), which were not declined by a TSP, need to be refunded at a later time:

- For a full refund of a Billing detail the C4/D4 record(s) shall be refunded by R2/S2 record(s) (C4/D4 → R2/S2)
- For a partial refund of a Billing detail the C4/D4 record(s) shall be refunded by R2/S2 followed by a new corrected transaction C3/D3 (C4/D4 → R2/S2 → C3/D3)

8.5.5 Resending

If a TC needs to resend previously rejected C4/D4 record(s), he shall issue C3/D3 record(s). If any changes were agreed between TC and TSP (e.g. changed amount) they have to be applied in this step.

8.5.6 Quality framework

C4/D4 records are considered as reconstructed transactions “TX_{rec}” in the sense of the quality framework described in document 307.

8.6 C5/D5 record

Currently not used.

8.7 C6/D6 record

A C6/D6 record is used to transmit a Billing detail where the DSRC communication could not be completed.

The Billing detail will be sent with an amount differing from zero (0) if the recorded data is sufficient to reconstruct the transaction and identify the Service User. All information regarding this transaction can be given in one line (including VAT).

The Billing detail will be sent with an amount of zero (0) if the transaction cannot be reconstructed.

Information regarding a Billing detail with mixed VAT rates shall be divided in several lines to cover the different VAT rates for each part of the transaction. In these cases, there will be one record with the code C6 and additional record(s) with the code D6 containing the parts of the transaction with different VAT rates.

8.7.1 Aggregation

If the C6/D6 record(s) are aggregated, they shall only contain the technical information (e.g. Authenticators, exact location of the transaction, net amount ...) and the field “Fee (VAT included)” shall be filled with zeros (0).

For details on the aggregation see E1 record.

8.7.2 Non-acceptance by TSP

If a TSP concludes that the sent C6/D6 record(s) are not correct, he may decline them by the use of the TIC file. All C6 record(s) and D6 record(s) belonging to the same Billing

detail shall be rejected together if an error in one part is detected. In this case the reason for the rejection shall be included in the field “Reason of rejection EasyGo”.

8.7.3 Refund

There are two cases to distinguish if Billing details transmitted through C6/D6 record(s), which were not declined by a TSP, need to be refunded at a later time:

- For a full refund of a Billing detail the C6/D6 record(s) shall be refunded by R2/S2 record(s) (C6/D6 → R2/S2)
- For a partial refund of a Billing detail the C6/D6 record(s) shall be refunded by R2/S2 followed by a new corrected transaction C3/D3 (C6/D6 → R2/S2 → C3/D3)

8.7.4 Resending

If a TC needs to resend previously rejected C6/D6 record(s), he shall issue C3/D3 record(s). If any changes were agreed between TC and TSP (e.g. changed amount) they have to be applied in this step.

8.7.5 Quality framework

C6/D6 records are considered as incomplete transactions “TX_{incomp}” in the sense of the quality framework described in document 307. This is also the case when the transactions could be reconstructed and have an amount differing from zero (0) as the DSRC transaction was still incomplete.

8.8 C7/D7 record

8.8.1 Use

A C7 record is used to transmit a Billing detail which was not registered as an EasyGo transaction in the lane at the time of passing but instead initiated after a customer complaint when being invoiced in the enforcement process (e.g. by an external debt collector). All information regarding this transaction can be given in one line (including VAT).

Information regarding a Billing detail with mixed VAT rates shall be divided in several lines to cover the different VAT rates for each part of the transaction. In these cases, there will be one record with the code C7 and additional record(s) with the code D7 containing the parts of the transaction with different VAT rates.

8.8.2 Aggregation

If the C7/D7 record(s) are aggregated, they shall only contain the technical information (e.g. Authenticators, exact location of the transaction, net amount ...) and the field “Fee (VAT included)” shall be filled with zeros (0).

For details on the aggregation see E1 record.

8.8.3 Non-acceptance by TSP

If a TSP concludes that the sent C7/D7 record(s) are not correct, he may decline them by the use of the TIC file. All C7 record(s) and D7 record(s) belonging to the same Billing detail shall be rejected together if an error in one part is detected. In this case the reason for the rejection shall be included in the field “Reason of rejection EasyGo”.

8.8.4 Refund

There are two cases to distinguish if Billing details transmitted through C7/D7 record(s), which were not declined by a TSP, need to be refunded at a later time:

- For a full refund of a Billing detail the C7/D7 record(s) shall be refunded by R2/S2 record(s) (C7/D7 → R2/S2)
- For a partial refund of a Billing detail the C7/D7 record(s) shall be refunded by R2/S2 followed by a new corrected transaction C3/D3 (C7/D7 → R2/S2 → C3/D3)

8.8.5 Resending

If a TC needs to resend previously rejected C7/D7 record(s), he shall issue C3/D3 record(s). If any changes were agreed between TC and TSP (e.g. changed amount) they have to be applied in this step.

8.8.6 Quality framework

C7/D7 record(s) are considered as video-based transactions without a matching contract “TX_{vid2}” in the sense of the quality framework described in document 307.

8.9 C8/D8 record

8.9.1 Use

A C8 record is used to transmit a Billing detail which was not registered as an EasyGo transaction in the lane at the time of passing but is based on the relation between licence plate and OBE number on the HGV list. The licence plate, which was registered during the passage by other means as a DSRC transaction (e.g. video), will be transformed to an ordinary EasyGo transaction using the OBE from the HGV list. All information regarding this transaction can be given in one line (including VAT).

Information regarding a Billing detail with mixed VAT rates shall be divided in several lines to cover the different VAT rates for each part of the transaction. In these cases, there will be one record with the code C8 and additional record(s) with the code D8 containing the parts of the transaction with different VAT rates.

A TC cannot send a C1 and a C8 for the same OBE and location at the same time where both include values. If both transactions are sent one of them must be with zero value. If there is a time difference between the C1 and C8 it is probably two transactions where one is identified via license plate (C8) and the other via the OBE (C1).

8.9.2 Aggregation

If the C8/D8 record(s) are aggregated, they shall only contain the technical information (e.g. Authenticators, exact location of the transaction, net amount ...) and the field “Fee (VAT included)” shall be filled with zero’s (0).

For details on the aggregation see E1 record.

8.9.3 Non-acceptance by TSP

If a TSP concludes that the sent C8/D8 record(s) are not correct, it may decline them by the use of the TIC file. All C8 record(s) and D8 record(s) belonging to the same Billing detail shall be rejected together if an error in one part is detected. In this case the reason for the rejection shall be included in the field “Reason of rejection EasyGo”.

8.9.4 Refund

There are two cases to distinguish if Billing detail transmitted through C8/D8 record(s), which were not declined by a TSP, need to be refunded at a later time:

- For a full refund of a Billing detail the C8/D8 record(s) shall be refunded by R2/S2 record(s) (C8/D8 → R2/S2)
- For a partial refund of a Billing detail the C8/D8 record(s) shall be refunded by R2/S2 followed by a new corrected transaction C3/D3 (C8/D8 → R2/S2 → C3/D3)

8.9.5 Resending

If a TC needs to resend previously rejected C8/D8 record(s), he shall issue C3/D3 record(s). If any changes were agreed between TC and TSP (e.g. changed amount) they have to be applied in this step.

8.9.6 Quality framework

C8/D8 record(s) are considered as video-based transactions with a matching contract “TX_{vid1}” in the sense of the quality framework described in document 307.

8.10 C9/D9 record

Currently not used.

8.11 E1 record

8.11.1 Use

Any TC is allowed to use aggregation optionally (e.g. to reduce the number of lines on the invoice and avoid rounding differences).

If aggregation is used by a TC the following rules are mandatory:

- All Billing details (C1/D1, C2/D2, C3/D3, C4/D4, C6/D6, C7/D7 and C8/D8 record(s)) with an amount differing from zero (0) for the same OBE, PAN and VAT rate within one calendar day shall be aggregated into one or more aggregated E1 records with a unique identifier (Reference number).
- All Billing details (C1/D1, C2/D2, C3/D3, C4/D4, C6/D6, C7/D7 and C8/D8 record(s)) with an amount of zero (0) for the same OBE and PAN within one calendar day shall be aggregated into one or more aggregated E1 records with a unique identifier (Reference number).
- These Reference numbers shall be associated to the generated aggregated E1 record(s) and each of the Billing details (Cx/Dx record(s)) it is stemming from in the field “Invoice transaction aggregation number”.

If aggregation is not used by the TC the field “Invoice transaction aggregation number” shall be filled with zeros (0).

The following rules apply to aggregation:

- Cx/Dx record(s) from different calendar days contained in one TIF file shall be aggregated into different E1 records
- Cx/Dx record(s) with a different VAT rate contained in one TIF file shall be aggregated into different E1 records
- Cx/Dx record(s) where the OBE and/or the PAN changes during one calendar day shall be aggregated into different E1 records

8.11.2 Aggregation

Not applicable

8.11.3 Non-acceptance by TSP

If a not accepted Billing detail is part of an aggregation, the whole aggregate shall be declined by the TSP. For each contained Billing detail the reason of rejection shall be noted when it is rejected. Any record, which is formally OK, but rejected because of another record in the same aggregate is not accepted shall be marked accordingly, so that it can be resent immediately.

8.11.4 Refund

Refunding of any Billing detail contained in an aggregated E1 record has no influence on the aggregated E1 record it was part of.

The R2/S2 record(s) used for refunding will be aggregated into a T1 record applying the same rules of aggregation as for an E1 record.

8.11.5 Resending

An aggregated E1 record is always generated from the underlying Cx/Dx records and thus sent in accordance with the rules applicable to them.

8.11.6 Quality framework

Aggregated transactions are not regarded in the quality framework.

8.12 T1 record

Use –See E1 record above

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Appendix A: Validation principles per TC.

The table below shows the validation principles used by individual TCs.

Actor ID	Actor name	Country code	Validation by	
			PAN	OBE-ID
100xxx	Norwegian TCs	NO	Yes	
101xxx	Norwegian Ferrys	NO	Yes	
200001	A/S Storebæltsforbindelsen	DK	Yes	
200002	CPH Parkering	DK	Yes	
200003	Molslinjen A/S	DK	Yes	
200004	Scandlines Danmark A/S	DK	Yes	
200007	CPH Parkering - TMS	DK	Yes	
200009	APCOA Parking DK A/S	DK	Yes	
200010	Danske Færger A/S	DK	Yes	
200011	Molslinjen A/S	DK	Yes	
200012	Færgeselskabet Læsø K/S	DK	Yes	
200013	Fjordforbindelsen Fr. Sund	DK	Yes	
250001	Scandlines Deutschland GmbH	DE	Yes	
260001	ASFINAG	AT		Yes
270001	DARS	SI	N/A	N/A
400001	Øresundsbro Konsortiet	SE	Yes	
400002	Forsea AB	SE	Yes	
400003	HH Ferries Helsingborg AB	SE	Yes	